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Animated storytelling in 360 degrees

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Forord

Jeg har alltid vært fascinert av populærkulturelle uttrykk. Som barn var jeg storkonsument av tegnefilm, dataspill og tegneserier. Dette har vedvart, og delvis også blitt mitt levebrød. Som animator og nerd, ble nysgjerrigheten min vekket når flere studioer begynte å produsere animerte kortfilmer for VR. Der var derfor nærliggende å anrette Masteroppgaven rundt dette temaet.

Jeg underviser i bl.a. animasjon og VR ved Høgskolen i Innlandet, og ønsket å ta en Mastergrad for å få mer akademisk tyngde. Jeg tror også arbeidet med oppgaven, vil komme studentene mine til gode, siden mye av stoffet kan være relevant i forhold til kursene jeg underviser i. Å kombinere utdanning, jobb og familie har selvfølgelig vært intenst og krevd at all tid disponeres best mulig. En god porsjon selvdisiplin, samt dyp interesse for temaet har vært en stor fordel, men det har nok vært like viktig å være omgitt av inspirerende og forståelsesfulle mennesker.

Jeg retter en stor takk til min veileder og gode kollega, Håvard Vibeto, som jeg mistenker har overskredet sine allokerte veiledningstimer for lenge siden. Han har lest og kommentert utallige utkast i løpet av året, og uten hans oversikt over litteratur og teori, samt innsikt i strukturering av akademiske tekster, hadde arbeidet blitt mye tyngre. Jeg må også takke min arbeidsplass, Spillskolen ved Høgskolen i Innlandet, for støtte, oppmuntring og praktisk tilrettelegging for deltagelse på samlinger, hjemmeeksamener etc.

Sist, men ikke minst ønsker jeg å takke min familie for uvurderlig støtte og tålmodighet. Arbeidet med oppgaven har grådig tatt for seg av både min tid og oppmerksomhet, helt klart på bekostning av andre ting. Jeg har ikke hatt på meg VR-briller absolutt hele tiden, men jeg har nok likevel vært altfor mye nedsenket i andre tanker og vært kognitivt tilstede helt andre plasser. Men nå er jeg snart tilbake i *The Ordinary World*, forhåpentligvis med en eliksir i sekken.

Abstract

This Master thesis is examining how *film form* and *film style* is utilized to tell stories within *VR movies*; animated shorts aimed at screening through *head mounted displays (HMD)*. Mainly, these shorts have a linear narrative, but simultaneously leave some decisions to the spectator, e.g. where to turn their head at any moment, consequently leaving the framing of shots to the audience. Since they all have a certain degree of interactivity, these productions have inherited features from both movies and games. Thus, the theoretical basis will include works from both academic fields. The objective is to study what parts of film form and film style are still applicable within a ubiquitous 360-degrees view. I will also study how the potential sense of immersion and spatial presence achieved by the 360-degrees view influences the narration. The thesis is conducted as a qualitative analysis of the following study objects:

Fan, M. (Producer) & Darnell, E. (Director). (2016). *Invasion!* [Animated short for 360 degrees screening]. USA: Baobab Studios.

Eisenmann, D. (Producer) & Osborne, P. (Director). (2016). *Pearl*. [Animated short for 360 degrees screening]. USA: Evil Eye Pictures.

Cellucci, C. (Producer), Pinkava, J. (Director) & Oftedal, M. (Director). (2018). *Piggy*. [Animated short for 360 degrees screening]. USA: Google Spotlight Stories.

The first selection, *Invasion!* (Fan & Darnell, 2016), is one of the earliest attempts of transferring animated movies into HMDs, and in this one the spectator additionally is granted with an avatar. The second selection, *Pearl* (Eisenmann & Osborne, 2016) is considered a milestone within the medium as the first 360 animated short (and the only one till this date) to receive a nomination for an Academy Award. The final selection, *Piggy* (Cellucci, Pinkava & Oftedal, 2018) includes narrative elements proceeding in real time, and the pacing and order of events can thus partly be influenced by where the spectator is turning their gaze.

Under the headlines *Film Form*, *Film Style* and *Immersion/Presence*, I will examine how a ubiquitous visual display affects the way a narrative pattern (film form) is constructed, and how the technical and aesthetic devices (film style) are utilized to convey this pattern. Finally, I will look at whether these movies are able to give a sense of immersion/presence and how this might influence the narrative.

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1. Introduction

Virtual reality, VR, has existed for decades, but during the last couple of years the threshold for accessing the medium has been considerably lowered, both from a consumer and a producer perspective. The reason might be an increased assortment of low-cost equipment for the consumer market, coupled with attention and investments from profiled multinational companies, like Facebook and Google (Bucher, 2018, p. 1-3; Tricart, 2018, p. 15-17). This in turn has led to an increased awareness, maybe even a hype, around mediated alternate reality experiences.

Even though Ivan Sutherland began prototyping *The Ultimate Display* already in the sixties (Chan, 2015, p. 15-16; Manovich, 2001, p. 102) and Jaron Lanier (2017) and his company *VPL Research* developed several sensory stimulating gadgets in the eighties people are still talking about VR as a new medium. One of the reasons might be that it still has not been assigned to specific areas of use. With the ability to convey alternative realities, VR is not, by nature, bound to a definite selection of disciplines; everything that exists in *reality* can principally be dealt with in *virtual reality* (Lanier, 2017, p. 54).

1.1 Cinematic experiences in 360 degrees

According to Bolter & Grusin (1999, p. 45-46) new media will always advocate its existence by mimic already established media. The same goes for VR. The development of the technology has to a large extent been driven by the videogame industry, which have adopted and further developed their existing concepts to the VR-platform. With its subjective perspective, VR is well suited for already established videogame genres like first person shooters and simulator games. But the videogame industry is not the only field looking towards VR as a platform. The movie industry has also started trying out the technology for cinematic storytelling.

So far, cinematic VR-experiences are characterized by experimentation, materialized as everything between simple 360-degrees shorts, to being parts of more complex installations. An example of the latter is Alejandro González Iñárritu's VR experience *Carne y Arena* (Billheimer, & Iñárritu, 2017), which besides offering a visual and auditive experience through a VR headset, give the user a tactile feeling as she is supposed to walk barefoot inside a square covered with sand (Cronk, 2018).



Figure 1: Spectator experiencing *Carne y Arena* photographed by Emmanuel Lubezki (Utichi, 2017).

For VR, both conventions and genres are still waiting to be settled, and the lack of standardizations is reflected by the wide range of terminology used. The experiences have been labeled *360 film*, *Cinematic VR*, *VR-film*, *Narrative VR* and *Immersive Movies* – to name just a few. Prestigious film festivals, like *Sundance Film Festival* and *Tribeca Film Festival*, is programming an increasing number of VR-films, and cutting-edge studios like *Oculus Story Studio/Fable Studio*, *Felix & Paul*, and recently even *Disney* are constantly working on pushing boundaries exploring the uncharted territory of VR as a storytelling medium (Bucher, 2018, p. 100; Melnick, 2019; Opam, 2016; Sumra, 2018).

1.2 A new primitive period?

Kristin Thompson describes a formal change in the history of cinema as a result of technological innovations, like sound, color and widescreen. She refers to a widespread term among historians, *the primitive period*, describing cinema's first 10-15 years. These early films were mainly concerned around "simple comedy or melodrama, topical subjects, exotic scenery, trick effects, and the sheer novelty of photographed movement" (Bordwell, Staiger & Thompson, 1985, p. 157). Especially cinema's dawning years as a commercial medium (1895-1902) where dominated by one-take non-fiction films (Bordwell, Staiger & Thompson, 1985, p. 159). Roughly put, cinema was initially influenced by photography and vaudeville acts. The shift to a more fictional use came when movies adopted characteristics from more narrating types of media, like the novel or theatre. The evolution to a more standardized grammar for cinematic storytelling, e.g. with the introduction of editing and a systematic utilization of different camera angles, turned cinema into another phase, *the classical period*. According to Thompson, this is another stylistic period in cinema stretching from 1909 to

1928 (Bordwell, Staiger & Thompson, 1985). There are a lot of similarities between today's VR and cinema's primitive period. First of all, there are many shared themes. VR is suitable to transport the spectator to exotic environments, like outer space (e.g. End Space VR), and to astonish with visual effects, like trustworthy representations of dinosaurs (e.g. Back to Dinosaur Island). VR experiences telling linear stories are quite few, and they are mostly shot in longer takes from one single view, equal to primitive films (Bordwell, Staiger & Thompson, 1985, p. 174).

Presently it seems that users of VR are more astonished by the discontinuity between what their senses tell them and what they know to be true, than the content mediated. This bears a strong resemblance to how film theorist Tom Gunning described humankind's first encounter with moving pictures (Bolter & Grusin, 1999, p. 155). According to Gunning, early cinema did not originally claim status of being a device for fictional narrative. The fascinating aspect was that it could capture and replay real life motion. In other words, the technology itself was the attraction, not the actual content. Though cinema evolved into a medium for storytelling by conventional orchestration of its subcomponents, it could just as well resign to what Darley (2000, p. 39) calls spectacle entertainment. Through history there has been large numbers of apparatuses serving entertainment purposes for a certain extent of time, but without eventually developing into mediators for fictional narrative. Darley mentions the *Phantasmagoria*, a magic lantern-show based on optical illusions, but there are countless examples from more recent years as well, e.g. *Cinerama* and *Sensorama* (Chan, 2015), not to forget contemporary 3D glasses for television which never did catch on. When prominent studios are developing linear storylines for VR/360 it seems, in many cases at least superficially, they are just rendering a traditionally short film to be displayed on a new platform. Again, other productions have no obvious narrative at all, but seek to provoke a certain emotion or mood e.g. frighten the spectator by placing her next to an uncanny undead or a large dinosaur. In examples like this the medium is used as spectacle and is more akin to a roller coaster ride at an amusement park, than a cinematic movie, or a novel for that matter.

1.3 Narration

Narration, or *storytelling*, has a wide range of functions inside a human culture. According to the Aristotelian concept of *catharsis*, stories trigger a mentally, and perhaps even spiritually, cleansing (Campbell, 2008, p. 19; Vogler, 2007, p. 203). But maybe more than that, can narrative be a device for interpreting and processing our perceived surroundings. Humans are

constantly sorting their impressions and experiences into patterns to make sense of events and surroundings (Bucher, 2018, p. 45-46; Rose, 2011, p. 1-2). Inductively we draw causal relations between separate incidents to connect them into a larger proceeding. Gestalt theory investigates how we recognize patterns formed by multiple distinctive elements and visualize them grouped together as a new whole (Johnson, 2014, p. 13-27). Ricoeur stated that narrative had the purpose of organizing events to aid our comprehension of time (Therrien, 2009). Derived from all this, we might suggest storytelling to be a way for humankind to organize life into causality and completeness, and thus establish an order to a chaotic and intangible world.

We find the use of storytelling in a wide range of communicative fields; mythologies, religion, politics, advertising and so on. It has been used as a tool for persuasion, education and consolidation, to mention just a few. It can even work as an instrument for creating discord and polarization, a phenomenon we find in everything from historical totalitarian propaganda to the populist rhetoric of contemporary politics (Campbell, 2008, p. 28, 333-337; Fallwell, 2010). The awareness and understanding of storytelling principles is therefore crucial in order to navigate through life and is also probably why some VR experiences attempt to tell stories.

1.4 The objective of this thesis

Though many 360 degrees animated movies propose to tell linear narratives, they additionally leave some decisions to the spectator, e.g. where to turn their head at any moment, consequently leaving the framing of the shot to the audience. In some cases, even the order of events can be influenced by the spectator. These productions have inherited features from both movies and games, and hence resides in a grey area between the two artistic disciplines. Because of this I want to examine which cinematic devices that are still applicable when the movie plays out in 360 degrees. My understanding of cinematic devices will be based on Bordwell & Thompson's categorization of *film form* and *film style*, that will be elaborated in Chapter 4. Led from this I seek to examine this *research problem*:

How can film style and film form be used to tell stories in VR movies, and does these utilizations differ from cinema?

As mentioned, labeling cinematic VR experiences is yet to be standardized. For reasons I will

explain in chapter 3, I will refer to my study objects as *VR movies*. A significant property of these kind of films is the display they are mediated through. For the last century humankind has watched moving images on rectangular surfaces, either projected on the silver screen or materialized by electronic backlight transmitted through RGB-filters in a monitor. Though 360 degrees images are displayed on rectangular screens as well, the fact that they operate in pairs, each screen placed close to the spectator's eyes and displaying a slightly modified version of its twin image, can potentially give the audience a sensorial notion of being inside a three-dimensional, artificial world. Following from this, *immersion* and *presence* are commonly used terms used for both VR and 360 degrees (Calleja, 2011, p .32-34). Therefore, I will also look at how these aspects are influencing the narrative in my study objects:

Does the illusive sense of spatial presence contribute or conflict with the narrative in these movies?

I believe these questions are important to review for two reasons. First, the dissemination of a story is most successful when the actual medium's own mechanism for representation is exploited (Chatman, 1978, p. 37). Bolter & Grusin (1999, p. 49) quotes media theorist Steven Holtzman who argues that even though a new medium initially might mimic and repurpose already established media, it eventually needs to develop a unique language. Over time, a new medium must utilize its own affordances to distinguish itself from its predecessors. So, to be taken seriously as a *storytelling medium*, it is crucial for VR and 360-degrees movies to build its own system of logic in the same way pioneers like Georges Méliès, Edwin S. Porter, Lev Kuleshov and many others did in the early days of cinema. Second, if VR eventually will reach a widespread human consumption, it is not least important to be aware of how various configurations can influence the audience in different ways.

Østbye, Helland, Knapskog & Larsen (2007, p. 67-68) emphasize that every analysis must have an *objective*. The main goal of this thesis is to get an overview of affordances and limitations with 360-degrees cinematic experiences. Hopefully, the results of this thesis could serve as foundation for further research within the field.

2. Methodology

Methodology should always be driven by the research topic; *how* we find knowledge is dependent on *what* kind of knowledge we seek to find (Silverman, 2010, p. 10). With this thesis I will examine how animated short films represented through a *360-degrees view* tell stories, and how this differs from works intended for cinematic view. As an underlying framework I will use Bordwell's model for narration presented in his book *Narration in the Fiction Film* (Bordwell, 1985, p. 50), supplemented with narrative theories of Chatman (1978) and Genette (1980). As Bordwell's model suggests, narration in film is largely influenced by the film's *style*, i.e. its "systematic use of cinematic devices" (Bordwell, 1985, p. 50). Thus, this aspect will be a significant part of my analysis. The theories will be further elaborated in chapter 4.

2.1 Research design

According to Østbye et al. (2007, p. 260), a *research design* is an overall strategy on how to collect, analyze, process and present data, related to the given research problem. Within research, there are two main directions, *quantitative* and *qualitative*.

Quantitative research is based on data that can be measured numerically, like e.g. statistics. To increase representativeness, large amounts of numerical data is collected from broad, homogeneous populations. Quantitative research is usually *nomothetic*, which means that the researcher is seeking generalized knowledge based on the collected data, hence be able to reveal universal patterns (Kvarv, 2014, s. 57-58). *Qualitative research*, on the other hand, is commonly based on a smaller selection and the variables are not numerical but contain text. This approach goes deeper down into each variable, by analysis and interpretation. The data is usually collected through interviews, observations or text-analysis.

I will mainly look at the films isolated from social context and author's potential intentions, what Gripsrud (2017, p. 152-153) denominates *objectifying reading*. Within this interpretative strategy the text is considered as an independent artefact, ignoring relations to any human creator(s). Nevertheless, the relation to the text's predecessors can be taken into account, which I intend to do by comparing the study objects with examples from cinematography.

This will rely on data that cannot easily be quantified. The reason is, among other things, that most stylistic features in cinema does not have absolute functions or meanings. It all depends on the “film’s overall form and the immediate context” (Bordwell & Thompson, 2013, p. 191). To find valid data, I need to utilize *close reading* and research-based interpretation, which is why I choose a *qualitative* approach. The thesis can thus be included in the tradition of *text analysis*, which is a common research design within the human sciences. In short, this involves studying how a *text*, understood as a constellation of different signs, e.g. a movie, manifests meaning (Østbye et al., 2007, p. 55-77, 263).

The close reading will be performed by viewing the short films on different platforms. An optimal experience requires a more high-end equipment, and for this I will use an *HTC Vive* with *Siberia 200 Gaming Headset*. I will also watch them through a *Samsung Gear VR* which offers a midlevel experience but is quicker to boot up. In addition to this I will watch the movies multiple times on *Youtube (360 degrees)* on a *Windows-based PC*. The latter makes it easier to pause, rewind and take notes during the watching.

Regarding the study objects belonging to a relatively new medium which not yet has been widely researched, it is necessary to be flexible during the process. Østbye et al. (2007, p. 265) points out that within fields that still not have been studied systematically, one might need to use an *exploratory* research design. Explorative qualitative design is more open to adjustments and can enlighten uncharted academic fields. This again, might reveal new themes that can make a foundation for further research (Østbye et al., 2007, p. 270).

2.2 Analytical interest

Østbye et al. (2007, p. 68) also stresses another important condition for analysis; an inherent interest within the analyst herself. My personal motivation for the selection of study objects is a lifetime spent enjoying animated shorts, from the studios of Disney, Warner Bros, Fleischer, MGM, Walter Lantz and so on. During the last decade I have also produced two shorts myself as an independent filmmaker. This background is thus a large part of my *horizon of understanding*, a hermeneutic term coined by Gadamer, and which comprises the interpreter’s former knowledge and expectations (Gripsrud, 2017, p. 137-140). It will not be possible for me to avoid comparing everything I see with the shorts I watched from I was a child to adulthood. But in line with hermeneutic arguments this is not a problem, in fact it is necessary for a successful interpretation. It is out of the convergence of these *pre-understandings* and

the object of study answers can be found. According to Gadamer we cannot establish meaning without a dialogic process between the reader and the text, an enriching *fusion of horizons*. Consequentially my analysis will to a great extent be shaped by comparison of the new medium and its predecessors, the historical timeline of animated shorts stretching from the early days of cinema.

2.3 Objects of study

In addition to methodology and research design, another important element of a research is its *study objects*. I have selected three animated VR movies which will dominate my analysis. As already mentioned, within qualitative a small selection of study objects is common, most of all because it would not be possible with an in-depth interpretational analysis on large amounts of data. Nevertheless, it is important to make a selection that is representative. In this way, it is possible to inductively transfer the obtained knowledge to other works. I have picked films that I find particularly interesting both theoretically and analytical, what Grønmo (2016, p. 103) calls a *strategically selection*. My study objects are not necessarily interesting in the way that they tell unique or important stories but is technically innovative in the way they deal with formalistic and stylistic features. All of them have at least one trait that distinguishes them from the others and they are produced by professionals with considerable experience within the leading film industry. My selections are:

Fan, M. (Producer) & Darnell, E. (Director). (2016). *Invasion!* [Animated short for 360 degrees screening]. USA: Baobab Studios.

Eisenmann, D. (Producer) & Osborne, P. (Director). (2016). *Pearl*. [Animated short for 360 degrees screening]. USA: Evil Eye Pictures.

Cellucci, C. (Producer), Pinkava, J. (Director) & Oftedal, M. (Director). (2018). *Piggy*. [Animated short for 360 degrees screening]. USA: Google Spotlight Stories.

My primary concern is to make a selection that covers a certain diversity in the way narrative is conveyed. I have chosen *Invasion!* mainly because it is one of the earliest attempts of transferring animated movies into HMDs. The director Eric Darnell have a considerable track record from Dreamworks, e.g. *Antz* and several productions from the *Madagascar*-franchise

(Bucher, 2018, p. 214-215; Internet Movie Database, a; Nafarrete, 2016). And *Invasion!* holds a number of properties akin to popular animation from the nineties and beyond. At the same time, it offers something new by the ubiquitous images and that the spectator is granted with an avatar. It is compelling to look upon how this affects the immersion with the narrative.

My second selection, *Pearl*, is considered a milestone within the medium as the first 360 animated short (and the only one till this date) to receive a nomination for an Academy Award (Hall, 2017). This short is directed by Patrick Osborne, who has long time experience as an animator as well as directing Disney's *Feast* from 2014 (Internet Movie Database, c). Dramaturgical *Pearl* stands out from other works by its spatial constraints; the complete story is told through one single camera position. The story is also stretching over a long period of time, which is not usual in this medium.

Finally, I have chosen a short, called *Piggy*, which was released in Cannes, 2018 (Failes, 2018.06.14). Unlike the others this one includes narrative elements proceeding in real time, and the pacing and order of events can thus partly be influenced by where the spectator is turning their gaze. Even though the film is simple and experimental, this is one step further towards a fusion of cinema and video games and might anticipate how cinematic stories will be told in the future.

2.4 Procedure

According to Bordwell & Thompson (2013, p. 49, 111) film is made up of *form* and *style*. These will function as variables for this thesis, and I will organize each analysis into the following sections:

- *Film form*
- *Film style*
- *Immersion/presence*

Under these headlines I will examine how a ubiquitous visual display affects the way a narrative pattern is constructed (film form), and how the technical and aesthetic devices (film style) are utilized to convey this pattern. Finally, I will look at whether these movies are able to give a sense of immersion/presence and how this might influence the narrative. But first, I will in the following chapter go through key terminology.

3. Terminology

A crucial condition for any kind of research is *validity*. Simply put, this implies that the process of analysis is based on data that is correct and relevant according to the research objective. Metaphorically we can say that the instrument for measuring needs to be calibrated correctly. If not, all our data will inherit the same instrumental error. Another aspect influencing the quality of research is *reliability*. This involves how steady the output is when data is collected from multiple successively equal measurements. If there are limitations in an instrument's precision this can lead to random errors, i.e. low reliability (Østbye et al., 2007, p. 25).

These relations apply to qualitative text analysis as well. A valid and relevant analysis relies on a widely acknowledged theoretical foundation as well as transparency around method and procedure. Existing research and theory combined with close reading is the instrument for this thesis, which hopefully will result in valid and reliable findings. If so, they might be generalized and applied to other works. For a verifiable result it is necessary to calibrate the measuring device, i.e. be open about what I determine as the basis for this analysis. That is why I will proceed this section with describing key terminologies.

3.1 Virtual reality

In his memoirs “Dawn of the new everything - a journey through virtual reality”, one of Laniers many definitions of *Virtual Reality* is “hope for a medium that could convey dreaming” (Lanier, 2017, p. 45). The virtual reality-discourse, including decades of science fiction, is often orbiting around escaping or replacing the reality.

According to Bryson (1998/2013), Virtual Reality is “the use of computer technology to create the effect of an interactive three-dimensional world in which the objects have a sense of spatial presence”. The *effect* in this case, means a *perception* of being surrounding by existents, usually made by *computer graphics (CG)*, that appear to occupy a spatial volume. To accept it as another “reality” derives mainly from blocking out the real world. Usually this is caused by putting on a *head mounted display (HMD)*, a headset covering the user's eyes and ears with respectively two small screens and headphones. In this way, the visual and auditory sense will get input from a manufactured representation. The *real* is perceptually replaced by something *unreal*, as illustrated on the next page. The other senses are usually not affected, except touch

which in some cases can receive manufactured input through hand controllers offering haptic feedback.

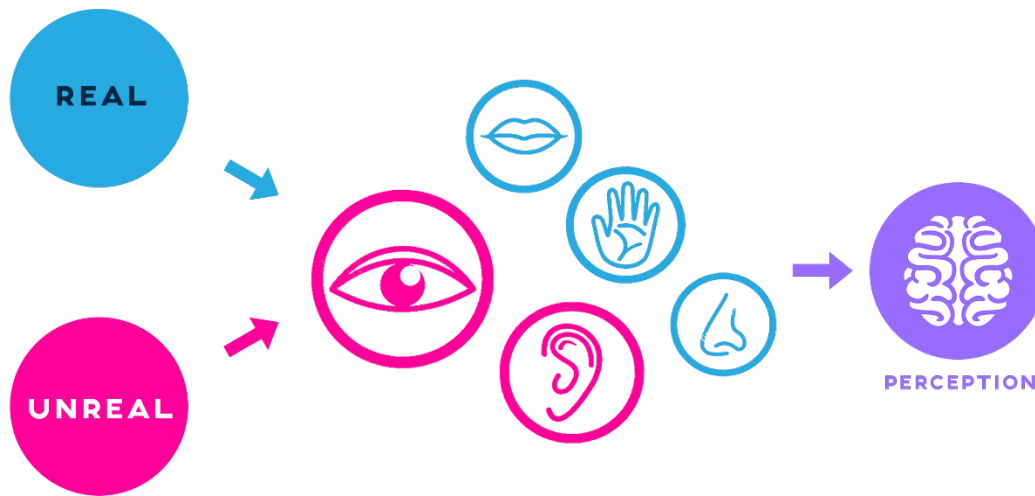


Figure 2: Illustration by author.

When vision and hearing is provided with alternative information it can cause the user to perceive being placed inside another environment. Fuchs, Moreau & Guitton (2011, p. 6-7) outlines three different modes of a virtual world. First, it can appear as a *simulation* of the real world. Usually, this does not necessarily imply an accurate replication of the real world by the means of authenticity and photorealism but could just as well be a simplified representation. The purpose of this kind of experience could be e.g. therapy for phobias or training for missions in hazardous areas. Second, the virtual world could be *symbolic*. The visual representation can in this case either be complete arbitrarily; e.g. constructed of signs or infographics, which is primarily abstract, but given meaning by cultural conventions. But it could also include iconic representations, like a simulation, but with embedded supplements, as Fuchs et al. (2011, p. 7) gives as an example, some of the elements colored red to indicate danger. Third, we're talking about a complete *imaginary* world. Though this can reassemble recognizable elements from the real world it is reconfigured as a non-existing alternative reality.

A *functional definition* of virtual reality could, according to Fuchs et al. (2011, p. 7) be a situation where the user experiences a condition unfettered by the real world's *time*, *place* and *action*. This means in short that VR conceals the three Aristotelian unities as they appear in reality from the user's sensory apparatus, and *illusionary* replaces them with artificial substitutions. Fuchs et al. (2011, p. 7-8) complements this further by also presenting a *technical definition*. If seen as a scientific and technical domain, virtual reality uses "computer

science and behavioural interfaces to simulate in a real world the behavior of 3D entities, which interact in real time with each other and with one or more users in pseudo-natural immersion via sensorimotor channels” (Fuchs et al., 2011, p. 8). This occurs when a virtual world is rigged with the options for real time interaction accompanied by feedback.

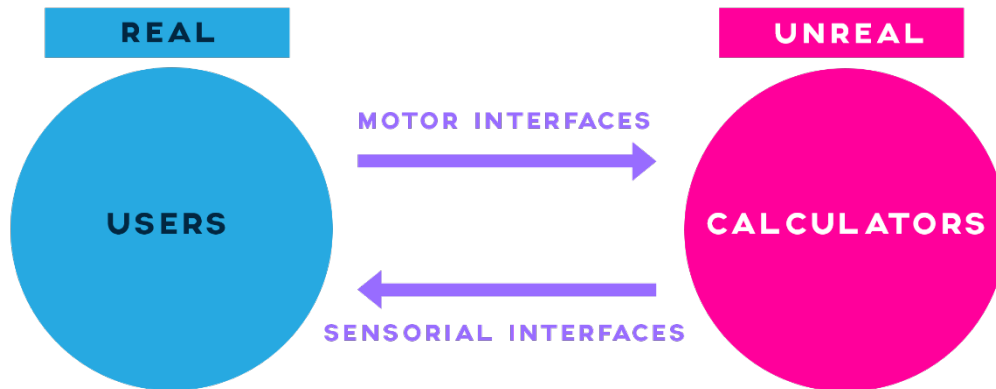


Figure 3: Illustration by author, based on Fuchs et al. (2011, p. 9).

Through a *motor interface* the user can interact with, and influence, the artificial existents and in return get feedback mediated through *sensorial interfaces*. The action performed through the *motor interface*, e.g. tracking the user’s head-movements, causes some sort of manipulation of the virtual world. This influence is immediately rendered back to the user, and thus act as an indexical sign of the user’s activity and proves the user’s “presence” in the virtual world. Like in the real world, a feedback-loop is established, where the user perceives signals from the virtual world, which again leads to a cognitive activity and action.

The functional definition does not fully capture the uniqueness of VR. Other media can offer the sense of substituting reality’s time, place and action as well, at least cognitively. The technical definition can describe other interactive media as well, e.g. video games. The most accurate understanding of VR would probably be a fusion of both the functional and technical definition. What is really important when distinguishing VR from other types of media is the ability to represent the content in a way that it appears to be volumetric, and not only flat representations on a screen or a canvas. I will look further into this phenomenon later in this chapter.

3.2 Stereoscopy

Most HMDs offer stereoscopic view. *Stereoscopy* is a technique for displaying images that makes use of our depth perception. The left and right eye will receive the surroundings from a slightly different angle as a result of the distance between them. This is often referred to as

binocular disparity. Each eye will perceive the same object from two different viewing positions, which results in respectively shifts in the object's apparent position and angle. This phenomenon is called *parallax* and will affect the appearance of proximate objects the most, since the two eye's viewing angles then will be more disparate (Grau, 2004, p. 141; Sherman & Craig, 2003, p. 119). For an HMD, stereopsis is technically achieved by displaying the visual content on two separate screens but with a slight shift in the rendered viewing angle, simulating the difference in each eye's optical point of view because of their unequal positioning. With the ability to represent parallax, stereoscopy adds an optical depth-cue to images which is not available when perceiving ordinary 2D-images (LaValle, 2017, p. 27-30; Sherman & Craig, 2003, p. 119).

3.3 User interface

The term *user interface* is mostly used to describe the facilities providing user manipulation of the mediated content in digital media. Early computers offered *command-line*, which was later replaced by *graphical user interfaces*, *GUI*. The former required a keyboard, while the latter also allowed a motion tracking device, namely the computer mouse. Over the years, several other *input devices* have been introduced, e.g. the touch screen. Graphical user interfaces are basically conventional constellations of signs and operating them requires learning (Rogers, Sharp & Preece, 2011, p. 157-175).

Virtual reality is, on the other hand, by many people reckoned to be the hope for a total annihilation of all traces of any arbitrary interface (Bolter & Grusin, 1999, p. 161-162; Lanier, 2017, p. 47). One reason for this could be the use of *natural interfaces*, which implies interacting with media the same way we interact with reality; through *speech* or *body gestures* (Ryan, 2015, p. 235-238; Sherman & Craig, 2003, p. 103, 115-203, 332). We can use our voice as an interface when interacting with smartphones or smart speakers, and our body, when interacting with gaming consoles and VR-equipment. The most obvious is the synchronization of the spectator's head movements and the optical point of view inside an artificial world.

Lanier (2017, p. 47) consider virtual reality as "substitution of the interface between a person and the physical environment with an interface to a simulated environment". By replacing the reality with an artificial alternative, he points at how everything actually can be part of an interface, only disguised as "real" elements. An example is picking up things in VR; since your actual motor activities is hidden from your sight and replaced with e.g. computer-

generated hands in a virtual world, the arbitrary connection is camouflaged. Contrary, to do similar activities in older videogames, like *King's Quest* (Sierra On-Line, 1984) you needed to write "Get carrot" with a keyboard and press enter to be able to pick up a carrot. Behind the concept of virtual reality lies a desire of interacting with an artificial world in a natural way, just like we conduct the real world; completely detached from the dependency of fabricated interfaces, and only putting our own body into use. This might again increase the sense of actually inhabiting a virtual environment, something we will look further into in Chapter 5. But when using the body as an interface, there are still technological limitations which will be described in the following section.

3.4 Degrees of freedom, DoF

In VR it is common to classify the ability to maneuver through the virtual world in *degrees of freedom (DoF)*. Rotation along the three spatial axis is termed *three degrees of freedom*. When using an HMD, these movements are caused by tracking the user's head orientation. (Tricart, 2018, p. 55). Three degrees of freedom only concerns the *rotation* of the view pinned from one position. Additionally, some VR-solutions can allow the user to *move* around inside a defined 3D volume. This will add another three degrees of freedom, displacement in x, y and z, and provide a total of *six degrees of freedom*, often referred to as *6DoF*.

Six degrees of freedom offers a perceptual experience Ryan (2015, p. 48) characterize as "fully spatial". By this, she means that the spectator can get the impression of being encircled by virtual existents. Ryan (2015, p. 47-49) lists three different aspects describing the sense of being inside a digital virtual world; *ubiquitous visual information*, *the ability to alter the field of view* and a *visual illusion of depth*. The first two derives from being enveloped by CG-graphics in a 360 degrees view. When the spectator turns her head, the HMD simultaneously counter-oriens the virtual world based on motion tracking.

The last aspect can be achieved by a combination of different means, and I will mention some of them briefly. First, *monocular depth cues* are visual arrangements that provides an illusion of depth without taking the *binocular disparity* into account. An example is foreshortening within perspective drawing, giving a sense of depth that can be experienced even with one of the eyes closed. Depth can also be simulated by utilizing the *binocular disparity*. For example, the already discussed *stereoscopy* provide different visual information for each of the spectator's two eyes (LaValle, 2017, p. 145-156; Sherman & Craig, 2003, p. 89, 119-120).

These are all illusions that can be achieved with a stationary vantage point, and without six degrees of freedom - from still images and cinema, to 360-degrees videos. What 6DoF VR adds, is a spatial distribution of digital existents in relation to real-time tracking of the spectator's movements and position. This enables the spectator to study e.g. a character from different angles, by altering her own real-world position. Till this date, technology can only offer user movement within a delineated volume, often described as *room scale*.

3.5 Room scale

A VR-solution with *room scale* is offering the sense of embodied transportation inside the virtual world (Tricart, 2018, p. 55). Technically, this is achieved by tracking the user's movements inside a calibrated area and assigning the data to the virtual environment. Six degrees of freedom provide the ability to walk around inside a virtual environment but only within a delimited area covered by the sensors. This area, in which the sensors are able to track the user's position is called *room scale*. Tracking of the user's real-world placement is mapped relatively to her placement inside the virtual environment. As the two mapped positions are updated simultaneously it gives the sense of moving along the three coordinate axes within the virtual world.

3.6 Real time graphics

When experiencing a VR-movie through an HMD, the camera angle is constantly shifting as a result of the tracking of head movements. This constitutes a demand for a continuous refreshment of rendered images. When the visual representation is rendered out successively while the audience are watching, it is called *real time graphics*. These movies are rendered through so-called *game engines*, the same technology used in the development of videogames, which allows continuously user-affection of the fictional world (Darley, 2000, p. 156; King & Krzywinska, 2002, p. 85; Tricart, 2018, p. 68).

3.7 Framerate and latency

How many images displayed successively per second is called *frames per second*, *FPS*, or *framerate*. For cinema the standard has been 24 fps since the introduction of films with synchronized sound (Bordwell & Thompson, 2013, p. 9-10). For VR, the developers tend to match the equipment's refresh rate to achieve a largest possible framerate, usually 60 or 120

Hz. This is to avoid breaking the illusion that the user is situated inside an artificial world. For example, if the user turns her head and the real time-rendering of new images is not happening fast enough, there will be a disharmony between how she moves and what she expects to see (i.e. that her surroundings are panning). This disparity is called *latency* (LaValle, 2017, p. 195; Tricart, 2018, p. 20-21). A low latency indicates an adequate framerate and will thus cause a more comfortable and flawless experience.

3.8 VR versus 360 degrees video

The lines between virtual reality and 360 degrees are blurry. Bucher (2018, p. 309) considers an experience to be VR when the hardware allows you to move around in a virtual space (6 DoF and Room Scale). Contrary, when the spectator is pinned to a predetermined point in the alternate universe, only able to look around (3DoF) he defines this as 360-degrees video. There are also different solutions for representing the spectator inside the fictional world, and to what extent her motions are tracked. Tricart (2018, p. 2) chooses to understand VR as when the content is displayed through an HMD, while 360 degrees as when the content is displayed on a flat screen. Hence, what distinguish the two is the (visually and auditory) occlusion of reality and whether the user interface is natural or not. When watching a 360 degrees video on Youtube, we still can see the reality around us. To change the point of view in this screening mode, we need to utilize an input device, like the mouse or the smartphones' gyroscope. When watching the same movie deployed to an HMD, this is all we can see, and we change the point of view by turning our head.

I support Bucher and Tricart's view on the differences between VR and 360 degrees and will for this thesis, study experiences which meet the mentioned requirements for VR; *sense substitution* (offered by encapsulating HMD), and *natural interface* (user's head orientation changes point of view). In addition to this, the experiences also enable stereoscopy and the ability to move within a limited area of the virtual environment (room scale) as a result of 6DoF. This allows for e.g. stepping closer to a character or watching characters and objects from different angles. My study objects meet these requirements, and can thus qualify as VR, and I will generally refer to them as *VR movies*. Nevertheless, since the spectator's ubiquitous view is a dominant and defining feature of the medium, I will occasionally use the term "360 degrees" as well.

4. Theoretical perspectives on narration

My primary theoretical focus will be on film as a *formal* and *stylistic system* (Bordwell & Thompson, 2013, p. 111). These concepts will be explained more detailed in the following sections but, in short, we can describe *form* as the dramaturgical structure and *style* as the aesthetic expressions of a specific medium (Bordwell, 1985, p. 50). *VR movies* refashion classical animated shorts, which is why I choose cinematic theory for this thesis. But supplied with user agency they also share traits with videogames, which is why I include literature from this field as well. Researching these kind of study objects requires multiple theoretical perspectives, i.e. *theoretical triangulation* (Østbye et al., 2007, p. 210). I have chosen the most updated theory I could find around some fields e.g. immersion, interactivity etc. In other areas, like e.g. narration, I have picked older works because I find it still relevant, and that it is broadly used as primary source for more recent research within the field. In the following sections I will go through the theory I find relevant for the analysis and discussion.

4.1 Story versus discourse

A *narrative* can be understood as a recounting of events and their interrelations (Genette, 1980, p. 25), while *narration* is the actual act of recounting (Chatman, 1978, p. 32). According to Chatman (1978, p. 19) a narrative consists of *story* and *discourse*. *Story* is often referred to as *fabula*, a “chronological, cause-and-effect chain of events occurring within a given duration and a spatial field” (Bordwell, 1985, p. 49).

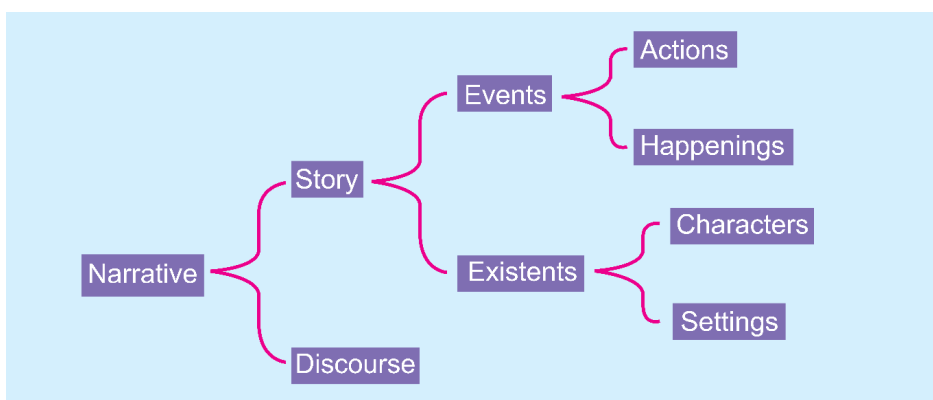


Figure 4: Illustration by author, based on Chatman (1978, p. 19, 26).

In short, we have the raw material, e.g. a series of causally related events, which is what Chatman denotes *story*. The *events* can be either *character actions* or other *happenings*, and

the involved *characters* and *settings* is by Chatman referred to as the story's *existents*. The events and existents can be expressed and conveyed in unlimited variations, and this will change how the receiver perceive and interpret the story. The act of representation is called *discourse*, what Propp, and occasionally Bordwell has referred to as *syuzhet*. Simply put, *Story* is *what* is being told, and *Discourse* is *how* it is told.

For example, Nolan's *Memento* (Todd, Todd & Nolan, 2000) tells a *story* of a man chasing his deceased wife's killers. But the audience do not follow a chronological succession of events leading to a solution. The protagonist is suffering from memory loss and we are experiencing the hunt in the same way as he does; by short glimpses and fragmented pieces of information. This is done by cinematic means to manipulate the story, e.g. composition and editing. This is *how* the story is told to us and is by that the *discourse*. The *story* could just as well be presented to us through the eyes of the killers. In that case, this alternative discourse would change the way we accessed and interpreted the *story*. The same content, i.e. *story*, can by the means of *discourse* be expressed in completely different ways by selecting what parts of the story is shared with the audience when, and in what way. There are however different views on what actually happens in the encounter between a narrative and the receiver.

Chatman believes to an extent that the receiver *reconstructs* a narrative, based on the work's inherent guidelines; what he calls the "*implied author*" (Chatman, 1990, p. 74). Bordwell, on the other hand, credit the receiver a more significant role in story creation. By his cognitive understanding, the narrative is emerging out of the convergence of spectator and work. Bordwell argues that story is *constructed*, not reconstructed, by the receiver. According to him, the narration is not fulfilled until the spectator organizes the cues provided by the film, omitting the film's "intent". One could argue that film, as a visual medium, do not express a narrator in the same way as e.g. a novel which is transmitted through text. But even within Bordwell's view, the narration is not totally left to the spectator without predefined guidelines but is strongly based on the film's set of cues (Bordwell, 1985, p. 62; Bordwell, 1989; Chatman, 1978, p. 146-148; Chatman, 1990, 74-77; Engelstad, 2015, p. 188-189).

When encountering a film, the spectator organizes the received information by what Bordwell calls *schemata*; meaning-making patterns based on prior knowledge and experience. He lists three types, and the first, *prototype schemata*, deals with recognizing identifiable classes, e.g. character types and motivations. The second, *template schemata*, involves more comprehensive structures used by the spectator to weld data into a whole. An example is

canonical story formats, which I will elaborate in chapter 4.2. Finally, *procedural schemata* regard the spectator's linking and organization of data to determine motivation and causality in the story. Based on these schemata, the spectator assumes and make inferences regarding what she perceives, as well as hypothesizes what will happen next (Bordwell, 1985, p. 33-37).

4.1.1 Story time versus discourse time

Parts of this section is based on the works of Genette who distinguish *story time* from *narrative time*. To avoid confusion, I will instead consistently use Chatman's labelling of the same concepts; *story time* and *discourse time* (Chatman, 1978, p. 62; Genette, 1980, p. 33). *Story time* is the imagined duration of the fictional *story* (fabula) being told. This is rarely equal to the time it takes consuming e.g. the film, because the representation of the story will only provide a certain selection of stretches. Genette proposes three concepts describing the relation between story time and discourse time; *order*, *duration* and *frequency*.

ORDER

According to Bordwell (1985, p. 49) a story consists of a succession of events causally connected to each other. That is to say, the spectator's imaginary construct based on the information she is provided, will arrange the story events in a *chronological order*. This is usually not the case when it comes to *how* the story is represented. In a movie we are used to being displaced back and forth in time by the editing. When the narrative order deviate from chronology Genette uses the term *anachronics* (Genette, 1980, p. 35-36). Starting from the *narrative NOW*, the "*established sense of present moment*" (Chatman, 1978, p. 62), we can either go back or forth in time. Thus, we have two main types of anachronics; *analepsis* and *prolepsis*.

An *analepsis* takes us back in story time and equals the *flashback* in film by inserting a stretch from the narrative past into the established, and usually dominant, *narrative NOW* (Bordwell & Thompson, 2013, p. 79; Chatman, 1978, p. 64; Genette, 1980, p. 49). A flashback can either reveal events prior to the story time's beginning or add new information to already unfolded events (Genette, 1980, p. 50). In *Fight Club* (Ross, Chaffin & Fincher, 1999) the protagonist, played by Edward Norton, eventually realizes that his psychopathic mentor, played by Brad Pitt, actually only exists in his mind. This is illustrated by a flashback where Pitt's character is removed from the scene. We then get a refreshed view of the same event, but this time looking from outside the protagonist's delusive perspective.

Contrary we can have leaps forward in time which Genette calls *prolepsis*. These are not as common as analepsises but occur when the narrative seeks to anticipate a glimpse of the future. In film this is called *flashforward* and a well-known example is one of the first scenes from *Terminator 2: Judgement day* (Cameron, 1991) where Sarah Connor, played by Linda Hamilton, anticipatory witnesses an apocalyptic future. Shuffling the order of chronology is a common feature in narratives. Another temporal aspect that affects the discourse time is Genette's second concept, *duration*.

DURATION

The duration of a *story*, in the meaning of *fabula*, is not restricted and can be anything from a few hours, Joyce's *Ulysses* (Joyce & Angell, 1993), to centuries, Kubrick's *2001: A Space Odyssey* (Kubrick, 1968). Usually only selected parts of this time span are presented to us through the representation, and these pieces give us the total *discourse duration*. Within a movie the relation between *story duration* and *discourse duration* is related to the editing. We can identify five different relations: *summary*, *pause*, *ellipsis*, *scene* and *stretch* (Chatman, 1978, p. 68-74; Genette, 1980, p. 95, 99, 106, 109).

In case of *summary* the discourse time is shorter than the story time. It is a tool for compressing time by speeding up, without omitting, certain story events. The *montage sequence* in Pixar's *Up* (Rivera, Docter & Peterson, 2009) is an example where we are presented with flashes of images showing a couple's shared life progressively through their many years together. In this way we get a general impression of their mutual past without lingering on specific events.

If the film on the other hand simply removed this sequence and cut directly from one moment to another, decades later, Genette would call this *ellipsis*. In this case the discourse time is shorter than story time as well, but with discourse time set to zero, meaning this portion of story time is not represented in the movie.

For movies there will be some parts where the discourse time equals the story time. Genette labels this mode of duration as *scene*. A dialog shown in its full extent is an example of this. Even though there are edits, shifting camera angles etc., the time represented very often correspond with the time the characters are spending performing the dialog.

Genette's understanding of *pause* are passages not linked to a specific moment of time within the narrative but contributes by contemplative elaboration. An example is the opening sequence of *Blue Velvet* (Caruso & Lynch, 1986) showing several evocative images from an

idyllic village. These images do not directly connect to the causally preceding of story events but have more the function of describing the setting, while temporal progression is paused (Genette, 1980, p. 99-100).

A less featured mode of duration is *stretch*. In this instance the discourse time exceeds the story time, either by representing the same stretch multiple times, e.g. overlapping editing, or by representing the footage in slow motion (Bordwell & Thompson, 2013, p. 168, 231).

FREQUENCY

The last concept describing the connection between story time and discourse time is *frequency*; to what extent instances of the same event are repeated throughout a narrative. There can be several reasons for these repetitions. Bordwell & Thompson (2013, p. 81) mentions the use of flashbacks to repeat an already exposed event embedded with additional information. The already discussed example from *Fight Club* would be a good example of that. They also mention stories where repetition gives us insight into different subjective perspectives. This occurs in many crime movies when we cinematically return to an already represented crime scene, seen through the eyes of e.g. a new witness when a mystery is getting solved. Another example is movies representing networks of narratives weaved together, like *Short Cuts* (Brokaw & Altman, 1993) and *Magnolia* (Anderson, 1999), where we, by following different characters, are represented with diverse perspectives on the same situations.

4.1.2 Story space versus Discourse space

The previous section showed different configurations of narrative *time*. Necessarily a narrative also has to take place *somewhere*, and just as we have discussed the relation between story time and discourse time, a narrative will also be constructed by *story space* and a *discourse space*. Chatman (1978, p. 96) defines *story space* as the total diegetic environment. The spectator has access to the *explicit story space*, what is actually represented inside the framing of a shot. *Implied story space* on the other hand is all the imagined fictional space not visible to us, but still part of the diegesis. Unlike literature, story space in cinema is *bestimmt*, i.e. the representations we are served have iconic resemblance to similar objects in the real world, which is closing our possibilities to subjectively imagine things like shapes, colors and composition (Chatman, 1978, p. 97). In movies, what the spectator can visually perceive, i.e. the explicit story space, equals what Chatman calls *discourse space*. He defines this as “focus of spatial attention”, which involve selecting existents and events from the total diegesis, and then determine the spatial relations between them and the spectator’s position (Chatman, 1978,

p. 98, 102). For cinema, discourse space is largely related to *Mise-en-scène* and *Cinematography*, which will be explained later in this chapter.

4.1.3 Narrative discourse versus interactivity

In video games, it is common to separate space into *game world*, the total diegesis including implied story space, and *game space*, the space accessible to the player through her spatial agency (Jørgensen, 2014). The latter equals discourse space, with the exception that it is not necessarily predefined by the author; the player can often decide *when* and *if* certain parts of the space are to be revealed. The same applies to a VR movie, even though it is usually limited to where to look inside the virtual environment without the ability to walk or teleport freely around.

We can draw parallels between VR movies and games according to *time* as well. Apparently inspired by the concept of story time and discourse time, Juul (2004) suggests two temporal concepts related to gameplay in video games; *play time* and *event time*. *Play time* is the actual real-world time needed to play a game, whether it is a classical boardgame or a videogame. *Event time* is the length duration of the events represented in the game world. The difference between a turn-based game like chess and e.g. a first-person shooter is that in the former case the progression halts, waiting for your turn. In the latter the game world is still spinning whether you act or not, which might e.g. cause your avatar getting killed or not reaching a deadline in time. Juul (2004) emphasizes that in real time-videogames the relation between play time and event time is one to one, similarly to Genette's duration mode *scene*. However, some strategy games offer a customization of the progression speed and thus offsets the relation between the two. Juul calls the relation between play time and event time *mapping*. This describes the moments where the player's real-world time and the fictional time coincides. For example, when a player presses a button and a game character immediately jumps, this is a result of a moment's encounter of play time and event time.

In real time experiences, whether it is videogames or VR movies, the engine is continuously listening for input, i.e. activity from the user. Any detected activity can be reflected back to the user as instant feedback. In VR movies, this feedback for the most part is expressed through camera movement. When the action in such a film is performed within one take, the spectator's actual time is constantly mapped to play time, the same way as for real time videogames. But when editing, e.g. by performing an elliptical leap forward in time, this relation will be broken, at least for a moment, with the risk of also affecting the seamless continuity in the narrative.

Figure 5 shows how a story's *existents* (characters, props and settings) and *events* (happenings or character actions) are discursively selected and distributed to an audience in non-interactive media, e.g. cinema. If we take the fairytale of Cinderella as an example, it is crucial for the audience to be informed that Cinderella loses her glass slipper on her way out of the castle, which eventually enables the prince to find her.



Figure 5: Illustration by author combined with photography by Weegee/Arthur Fellig (Uren, n.d.).

Figure 6 illustrates how interactivity can influence, and potentially interfere with the intended representation, as a result to an extended access to story space and/or a more freely disposal of the discourse time. If the audience are looking somewhere else when Cinderella leaves the ball, she may miss information required for comprehension of the following events. Simply put, watching a film through an HMD allows the spectator to see different things than the filmmakers have foreseen.

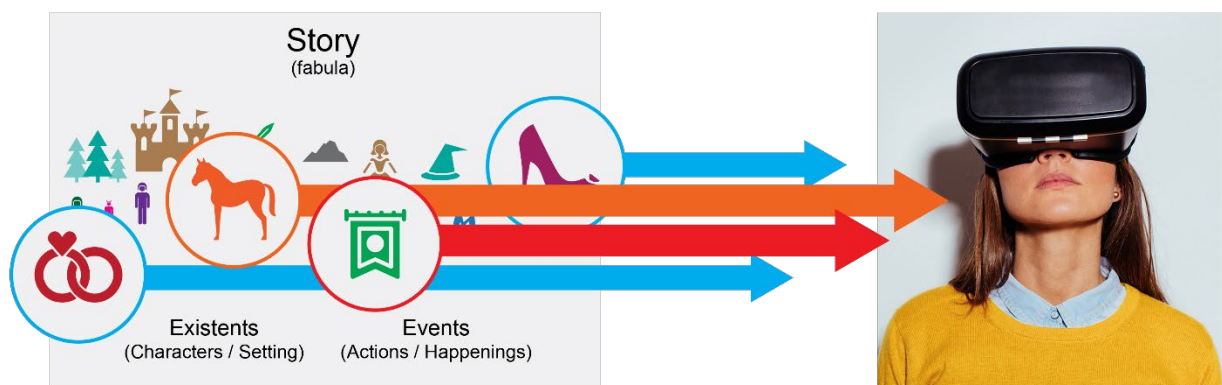


Figure 6: Illustration by author combined with photography from iStock by Getty Images (2016).

4.2 Film form

In order to accept a movie's separate parts as one whole, they need to be interconnected and formed into an underlying pattern. Bordwell & Thompson (2013, p. 72-75) regard this as *film form*. Different forms lead to different expectations and serves different purposes. In film,

there are numerous of possible forms. For example, many of Norman McLaren's films had an abstract form (Sito, 2013/2015, p.16-17), i.e. they did not tell stories but would still be regarded as one whole, i.e. one film. In this thesis I will focus on VR movies *telling stories*, i.e. they have a *narrative form*.

According to a perceptual-cognitive view, a narrative is constructed by testing information provided by the film against the spectator's schemata. For example, character types are identified by using *prototype schemata*, and stories within western popular culture very often fits established canonical formats, i.e. based on *template schemata* (Bordwell, 1985, p. 34-37, 48-50).

A large amount of narrative theory has its roots in Propp's *Morphology of the folk tale* (Propp, 1968). By examining a large corpus of Russian folklore and dismantle their narrative into subordinate components, Propp declared that most tales consist of common sets of *functions*. He understands functions as "an act of a character, defined from the point of view of its significance for the course of the action" (Propp, 1968, p. 21). By this, he means that even for different stories, the function of some main elements is similar. For example, one of the functions of a hero is to solve a problem, either the hero's name is Wonder Woman or Oskar Schindler. The functions are, according to Propp, a limited number of stable and constant components. Together they form a pattern, bonded by "time, space and causality" (Bordwell, 1985, p. 49; Propp, 1968, p. 88). There are several kinds of narrative structures. Common examples in fiction is *archetypes*, *the monomyth* and the *three-act structure* (Cambell, 2008; Larsen, 2003; Vogler, 2007).

4.2.1 Archetypes

Vogler consider *archetypes* not as specific characters with fixed properties but rather as *functions performed by characters*. This view is inspired by Propp and means that one character can act out several different archetypes during a narrative course (Vogler, 2007, p. 24). Based on Cambell's study of mythological archetypes, Vogler classifies eight main categories: *Hero*, *Mentor*, *Threshold Guardian*, *Herald*, *Shapeshifter*, *Shadow*, *Ally* and *Trickster* (Vogler, 2007, p. 26).

The Hero equals the protagonist, whether she actually is heroic or not. This is the character the audience is following, i.e. they experience the fictional world and events from her perspective, usually leading to identification and emotional involvement. *The Mentor* can have

the function of both encouraging The Hero to take the first step into an adventure and give her the necessary aids for succeeding. *Allies* are characters assisting The Hero through the trials and challenges, while *The Threshold Guardian* at some moment try to block The Hero's progress in some way. *The Herald* is someone or something announcing a forthcoming change, and often has the function of giving The Hero *The Call to Adventure*. The Herald could be the same character as another represented archetype, e.g. The Threshold Guardian or an Ally, or it does not need to be a character at all but e.g. a letter confirming Harry Potter acceptance at Hogwarts School of Witchcraft and Wizardry (Heyman & Columbus, 2001). *Shapeshifters* are characters who are shifting either when it comes to appearance or personality. The wicked witch in Snow White is one example, another one is double identity superheroes. In Frozen (Del Vecho & Lee, 2013), the character Hans is revealed as a cruel villain in the last part of the film, in contrast to our former impression of him as pleasant and honest. *The Shadow* represents the dark side and it is thus tempting to mention Darth Vader as an example, since he is both the villain and at the same time a representation of his protagonist son Luke Skywalker's inner darkness (Kurtz & Lucas, 1977). Vader is at the same time a *Shapeshifter*, just as already mentioned Hans from Frozen also can be regarded as a *Shadow*, which illustrates that one character can perform several functions. *Tricksters* usually brings redemptive energy and humor into the story. They can have the role of comical sidekick, like Shrek's Donkey who is also an Ally, or clever characters who causes imbalance without being affected themselves, like Bugs Bunny (Katzenberg et al., 2001; Vogler, 2007, p. 23-80). All the archetypes mentioned in this section represents Bordwell's *prototype schemata* and is one way to recognize patterns when it comes to the character's function in a narrative. Additionally, there are several common structures for constructing the causality of narrative events. In the next two sections I will briefly describe two of the most common canonical forms.

4.2.2 The three act structure

If we take *Back to the Future* (Canton, Gale & Zemeckis, 1985) as an example, it uses the form *three act-structure*. which is a widely acknowledged narrative form, described among many others by Larsen (2003), Engelstad & Tønnessen (2011, p. 45-59) and Vogler (2007). In *the first act*, we get to know all the characters with a focus on protagonist Marty, with all his teenage challenges; he is being bullied at school, he is embarrassed by his own family and he is trying to impress his girlfriend. *The second act* starts when Marty's friend, the eccentric scientist Doc, is shot down by vindictive Liberian terrorists which Doc previously defrauded.

To save his life, Marty escapes aided by a time machine, taking him thirty years back in time. The second act is usually the largest part of a movie and in this one it revolves around Marty's struggle to return to the present, as well as his attempts of changing the course of certain events that will improve or even be crucial to his existence, e.g. the killing of his friend, Doc, and challenges in the couple relation between his parents. All the parallel conflicts escalate and converge into a climax at the end of act two. As stated by Chatman (1978, p. 46), the protagonist's possibilities are dramatically reduced during plot progression, and at the transition between second and third act everything relies on one single thing; whether Marty manage to return to the present or not, which needs to be done at a certain place, and at a specific moment of time. It is a narrow escape but finally he manages to capture the energy from a striking lightning and the time machine can bring him back to present. After this climax, the third act proceeds with a denouement where many of the protagonist's initial challenges are resolved; like e.g. Doc wearing a bullet proof vest preventing him from being killed by the terrorists, Marty is no longer getting bullied and his family is more successful.

4.2.3 The Hero's Journey

Described above is the underlying narrative form of *Back to the Future* put into the *template schemata* of three-act structure. Other models can be applied to the same story as well, like *The Hero's Journey (The Monomyth)* by Joseph Cambell. This model was later reworked by Christopher Vogler who divided it into the following 12 steps; (1) *The Ordinary World*, (2) *The Call to Adventure*, (3) *Refusal of the Call*, (4) *Meeting with the Mentor*, (5) *Crossing the first Threshold*, (6) *Tests, Allies and Enemies*, (7) *Approach to the Inmost Cave*, (8) *The Ordeal*, (9) *Reward*, (10) *The Road Back*, (11) *The Resurrection* and (12) *Return with the Elixir*. These steps describe the key events in the proceeding of a narrative course from the perspective of a protagonist. This pattern is widely applied especially within the Western movie industry, though not every step is always present.

Vogler describes *The Ordinary World* as the "baseline for comparison" (Vogler, 2007, p. 87). Since the hero will go through a change, either by a shift of location like Frodo in *The Lord of the Rings* (Osborne et al., 2001) or a shift in life situations as for Woody in *Toy Story* (Arnold, Guggenheim & Lasseter, 1995), the Ordinary World needs to be established as basis for comparison when the protagonist later enters the new circumstances, by Cambell and Vogler called the *Special World*. Marty is brought from the *Ordinary World*, which obviously is present time, to the unknown *Special World* (the past), and finally back again. *The Call to Adventure* is Doc's invitation to look at his new invention. *The Refusal of the Call* usually is

hesitation or reluctance within the protagonist in leaving the Ordinary World. In *Star Wars* (Kurtz & Lucas, 1977) Luke Skywalker had his obligations at the uncle's farm preventing him from leaving for adventure, and in *Back to the future* we can understand Marty's skepticism to Doc's bizarre plans. The next step, *Meeting with the Mentor*, occurs when the protagonist is given something that is crucial for a successful journey. This might be knowledge, tools or anything else needed to take a trip or solve a task. Obi-wan Kenobi gives Luke Skywalker both confidence and a light saber, Doc shares the secrets behind his DeLorean DMC-12 with Marty. The latter is *Crossing the first Treshold* (to the Special World) when he starts up the time machine to get away from the terrorists. While being in the *Special World*, the protagonist will be confronted with several *Tests, Allies and Enemies*. Marty is accidentally close to ruining his parent's relationship back in 1955 which would consequently baffle his own birth. Doc has also run out of the plutonium needed for travelling back to 1985. Derived from the previous section, the second act puts the protagonist into diverse trials and crisis' finally bringing him into *The Inmost Cave*. Here Marty is headed with his time machine towards a clock tower soon to be hit by a lightning, which is his one and only chance to return back to the *Ordinary World*. *The Ordeal* here is for Marty to arrive a certain spot at a certain velocity at a certain moment. This is usually the point where the tension is at its most intense and is in *Back to the future* magnified with further problems, as Doc's struggling with broken wires.

The successful return to 1985 is *The Reward*. This step can be seen as the protagonist's personal triumph for surviving The Ordeal, and the character might get some kind of dividend out of it, in form of e.g. love, material goods, like a treasure, or a new friend, like when Woody finally befriends his former rival Buzz Lightyear in *Toy Story*. Still at the brink of *The Special World*, the protagonist needs to make one last effort before *Resurrection*. Back in 1985, Marty once again witnesses the shoot-down of his friend, Doc. Only this time, Doc survives, thanks to the bullet-proof west. Finally, *The Return*, brings the protagonist back to the starting point. It could be literary to the same location as in *Back to the future*, or metaphorically, meaning e.g. peace is recovered in *Star Wars*, or regaining an inner balance like Woody overcoming his jealousy in *Toy Story*. *The Elixir* can be seen as something gained from The Hero's Journey, like the galaxy has, at least temporary, been saved from the empire in *Star Wars*, the already mentioned friendship and personal development in *Toy Story*. Or as in the case of *Back to the future*, Marty's existence has been dramatically improved compared to before his time travel (Vogler, 2007, p. 83-227).

Either we apply the *three-act structure* or the *monomyth*, the narrative of *Back to the Future* certainly follows an overall pattern. The events are causally linked, and the characters all serves different functions related to these events. All this information and the organizing into order and causality is regarded as the film's *narrative form*. This pattern, or schemata, guides the spectator's assumptions and hypothesis about what is going on, i.e. the *story* (fabula) (Bordwell, 1985, p. 31). The *form* is thus determined by both *story* and *discourse*. The latter, discourse, relies on media specific properties as well, which in film is often referred to as *film style*.

4.3 Film style

As mentioned above, Bordwell and Thompson's understanding of *form* is the underlying *pattern* of a narrative, presented through the *story* and *discourse*. But there is another system influencing the *discourse* i.e. *how* the pattern is conveyed to the spectator. *Style* is the film's "systematic use of cinematic devices" (Bordwell, 1985, p. 50), i.e. the technical aspects who works in synergy with the discourse (syuzhet) on representing the story (fabula). In every medium there is a set of stylistic and aesthetic devices that can be used to recount a story. These devices are conventional and needs to be learned by the receivers (readers, viewers etc.). As illustrated by a previous example, the film *Memento* utilizes composition and editing to establish a subjective recounting of a story. These techniques are part of a system of available devices for retelling stories cinematically. Bordwell & Thompson (2013) divide *film style* into four main categories; *Mise-en-scène*, *Cinematography*, *Editing* and *Sound*.

4.3.1 Mise-en-scène

The term *Mise-en-scène* is covering so to speak every aspect influencing the appearance of an image framed inside the shot of a film (Bordwell & Thompson, 2013, p. 113). *Mise-en-scène* can be divided into four subcategories; *setting*, *costumes and makeup*, *lighting* and *staging* (Bordwell & Thompson, 2013, p. 115).

MISE-EN-SCÈNE: SETTING

A film's *setting* is basically where the action takes place. As a spectator never will see the total diegetic scenery and surroundings, setting is also a construct emerged out of the audience's assumption and inference based on any given information (Bordwell, 1985, p. 49; Bordwell & Thompson, 2013, p. 115).

MISE-EN-SCÈNE: COSTUME AND MAKEUP

Mise-en-scène also includes *costume and makeup*, which contributes to plot construction e.g. by indicating time-period and character-type. For example, will our western conventions immediately recognize Captain Hook as a pirate because of his wicked grin and Elizabethan-inspired clothing style (Disney et al., 1953). Regarding CG and animation, it might also be appropriate to think of the *character design* as an aspect of costume and makeup, as this to a great extent forms the character's appearance.

MISE-EN-SCÈNE: LIGHTING

The 360-degrees animated short *Buggy Night* (Dufilho-Rosen & Oftedal, 2014) demonstrates how lighting and shadowing can be used for cuing the spectator's gaze. The action in this little short is taking place in a forest at night where everything is dark. If it was not for a spotlight travelling around the set, the spectator would not have seen much of the action. The spotlight is literally chasing the action, which illustrates how lighting can cue and constrain the representation in 360 degrees by highlighting areas where significant action is going to take place.

MISE-EN-SCÈNE: STAGING

In cinema, the spatial arrangement of elements and action inside the captured frame is called *staging*. In traditional film, the fixed spatial relation between the camera lens and the represented objects enables a wide range of discursive control over how, and when, the action will appear to the audience.

4.3.2 Cinematography

The aspects of filmmaking related to the camera is often referred to as *cinematography*. The term deals with both technical aspects as exposure and color, and the spatial relation between the lens and the subject.

CINEMATOGRAPHY: THE PHOTOGRAPHIC IMAGE

As with traditional cinema, VR movies can have a wide and diverse range of tonalities. But one important thing that distinguishes is the spectator's ability to choose her field of view. Firstly, artistic use of the lens is somewhat more limited in 360 degrees. The distortion of a wide-angle lens could be perceived as to dramatic as the image is covering the spectator's entire view (Bucher, 2018, p. 17). Secondly, not knowing at any time where the spectator is looking makes it hard to set areas out of focus with the intention of emphasizing certain elements in the image.

CINEMATOGRAPHY: FRAMING AND CAMERA POSITION

One of the most important cinematic techniques is *framing*; the arrangement of elements within the four edges of an image. Framing also involves the spatial relation between the spectator (camera lens) and the subjects represented. In cinema, this is predefined; the decision has already been made by one or more people from the film crew e.g. the director, storyboard artist or director of photography. In a 360-degree view, framing is no longer predefined but is continuously altered by the spectator's head movements (Bucher, 2018, p. 18). In these cases, framing equals the spectator's *field of view* at any moment.

CINEMATOGRAPHY: CAMERA MOVEMENT

For 360-degree views, it seems like camera movements are usually avoided. The reason might be to prevent motion sickness as a result of the imbalance between the felt movement and the visually perceived motion (LaValle, 2017, p. 343). When camera movements occasionally *are* implemented, the velocity is exceptionally slow and gentle, like the camera following the protagonist through a hallway in *Son of Jaguar* (Bodyfelt, Eisenmann & Gutiérrez, 2017).

4.3.3 Editing

Editing is when various shots with different durations are assembled together to form a joint meaning, e.g. a narrative. Shots that would interfere or just not contribute to the desired narrative progression are usually excluded, and editing can cue how the spectator interpret both time, space and action. Bordwell & Thompson (2013, p. 221-230) lists four stylistic patterns provided by editing; *graphic*, *rhythmic*, *spatial* and *temporal* relations between the shots. *Graphic relation* describes a visual resemblance between shot A and shot B, this could be shared colors, similar composition and more. *Rhythmic relation* utilizes the variation in duration among the assembled shots. A sequence can have a rapid pacing for increasing the tension, or the pacing can be slower to linger on scenery and establish a contemplative mood. *Spatial relation* occurs when the expected continuity between the assembled shots leads us to perceive isolated subjects and actions to take place within the same location. The well-known *Kuleshov effect* (Bordwell & Thompson, 2013, p. 227-228) illustrates that the assembled shots do not necessarily have any connection in real life, which can be exploited to construct spaces through editing.

In cinema, the *discourse time* is primarily constructed through editing. The *temporal relation* between the shots describes how the spectator interpret and cognitively construct story time. Different editing techniques can manipulate the shots' *order*, *duration* and *frequency*, as described in section 4.1.1.

4.3.4 Sound

Despite being an important sense on its own, *hearing* can also facilitate our visual comprehension. Eisenstein called the cinematic symbiosis of sound and image “synchronization of senses” (Bordwell & Thompson, 2013, p. 267). In VR, sound can have an additional facet that might add up to the evocation of another world. *Spatial sound*, or *3D sound*, is the ability to distribute sound sources within a fictional area of space. When experiencing a virtual environment with six degrees of freedom the technology allows positioning sound emitters like one positions 3d objects within the defined area (Tricart, 2018, p. 43). This enable e.g. the sound of pouring water to appear closer when the spectator moves closer to a visual 3D representation of a fountain within a virtual environment. This feature is unique for VR and might enhance the sense of immersion and presence, terms we will get back to in a later section.

4.4 System versus excess

While *form*, to a greater extent is independent of actual medium and more related to the underlying story structure, *style* can be seen as a toolkit provided by the actual medium. Bordwell (1985, p. 50, 53) highlights the strong linkage between *style* and *discourse* (syuzhet). They are both strongly involved in the phenomenal process, i.e. how the spectator is receiving the story, but where the discourse is taking care of the dramaturgical elements, style handles the technical side. They are of course strongly intertwined; for example, discourse space is largely determined by *framing* and *Mise-en-scène*. The figure below illustrates the relations between narration’s underlying systems.

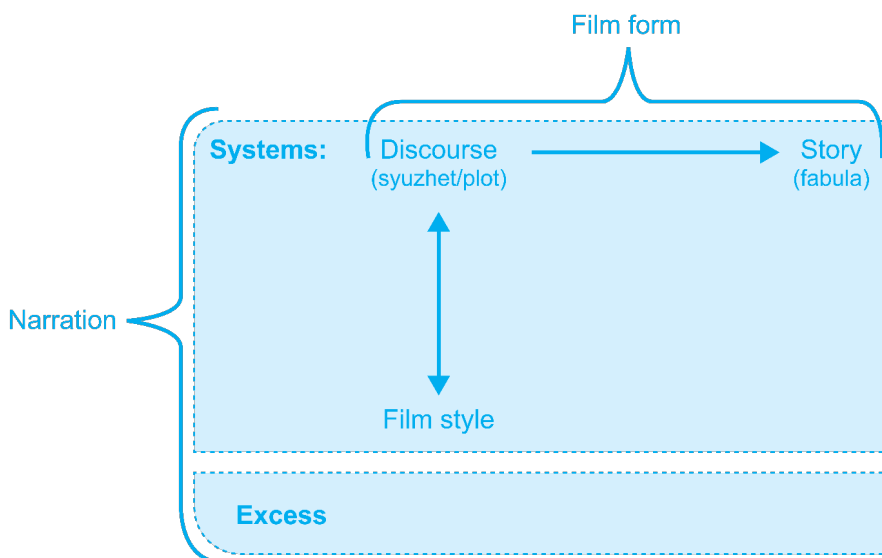


Figure 7: Illustration by author, based on Bordwell (1985, p. 50).

The figure includes another element, *excess*. This involves a film's "non-narrative" aspects, i.e. any intrinsic element that enhances the spectator's experience but where a narrative function cannot be traced directly (Bordwell, 1985, p. 53). An example is Wes Anderson's stylistic peculiarities, like extensive use of symmetrical compositions, strictly implemented color palettes and retro music (Renée, 2018). Visual and auditive devices like these do not, in any obvious manner, contribute to the "cuing and channeling" of the spectator's construction of the story as a causal "chain of events" (Bordwell, 1985, p. 49, 53).

Bordwell compares excess with Barthes' idea of the "*third meaning*". According to Barthes, a film has one *level of communication*, in which the spectator is provided with information, e.g. characters and setting. Second, there is a *level of signification*, which carries the first level's symbolic properties. For example, a film's represented information can signify a certain theme or message, originating from the filmmakers' intentional orchestration of filmic devices. For the spectator, the meaning is comprehended by referring a conventional set of codes. Barthes calls this "*the obvious meaning*". But a film grants the spectator with another type of meaning, which by nature is elusive and escapes any tangible analysis, "*the obtuse meaning*" (Barthes, 1977, p. 52-55). This third meaning is not narrowed down to predefined connotations, rooted in the filmmakers' intentions and culturally common symbols. According to Barthes, the third meaning do not signify specific meanings related to narrative coherence, but allows an infinite and inexhaustible selection of meanings, exceeding culture and prior knowledge (Barthes, 1977, p. 55). The previously mentioned opening sequence of *Blue Velvet*, as well as countless examples from Lynch's other films, holds a lot of signifiers that can evoke different kinds of mood, and other subjective experiences, without forming meaning in a systematic and unifying way. On top of the denotative and connotative levels cuing and constraining the spectator, there is an excess, which can engross the spectator into the fictional universe, but simultaneously counteract with meaning-formation.

In her article *The Concept of Cinematic Excess*, Thompson describes the friction between *narration*, understood as the Russian formalists' concept of *suyzhet/fabula*, and *excess*, as a "struggle of opposing forces" (Thompson, 1977, p. 54). According to her, the struggle evolves out of deviating motivation. She states that the presence and utilization of filmic devices in general are justified by *motivation*. For example, a character's actions are motivated by her objectives and needs, and camera settings are motivated by its purpose in relation to narrative comprehension. Thompson lists four aspects of film where motivation can deteriorate in favor of excess. First, existents can have a function regarding the narrative, but their actual visual

and physical appearance do not always derive from motivation. Second, the screening time devoted to each existent, has no absolute configurations in relation to meaning-formation. Third, a narrative itself can have different kinds of redundancy, e.g. representing the same event multiple times. Fourth, motivation may explain the spectator's first encounter with a filmic device, but recurring repetitions can purge it for meaning. For example, in *Blue Velvet* (Caruso & Lynch, 1986) colors have a symbolic function. Dorothy, played by Isabella Rossellini, is being repressed and manipulated by Frank, a criminal psychopath. He wants her to wear blue, and when she in some scenes is dressed in red, this can reflect her inner urge to break free from his control. Thus, the use of the colors red and blue is strongly motivated by the narrative. But during the film, the colors are overly used on different other elements as well. The repetitions dilute the motivational function and turns the attention over to the colors themselves as excess (Bordwell, 1985, p. 57; Thompson, 1977, p. 54-59).

Thompson argues that it is futile to look for narrative meaning in every detail of a film, as there will always be "elements which escape unifying impulses". The multifaceted medium of film will necessarily contain signifiers without a predefined signified, which leaves parts of the meaning-formation to the subjective spectator, at the expense of the narrative structure (Thompson, 1977, p. 57, 63). This thesis deals with films experienced in VR, which according to Bolter & Grusin (1999, p. 165) resembles the subjective style of film. This might constitute even more excess, in form of the sensation of being embedded into the diegesis. The following chapter will be devoted to the role of *immersion* and *presence* within VR.

5. Theoretical perspectives on immersion and presence

5.1.1 Remediation

Defining *media* is way beyond the scope of this thesis, but in short it can be characterized as “storage, dissemination, and transmission of experience” (Mitchell & Hansen, 2010, p. 172). Thus, the act of *mediation* can be regarded as human experience, either lived or imagined, converted and transferred to some kind of technology, e.g. a printed book or a digital display, and in this way made accessible for other people. Bolter and Grusin (1999, p. 21-44, 272) sorts mediation into two different strategies of representation. When the purpose is to conceal the act of mediation, they call it *transparent immediacy*. On the contrary when the goal is to emphasize the arbitrary interface, they call this *hypermediacy*. The latter typically applies to digital media where the sender wants the audience to be aware of the interface and thus encourage to interaction, e.g. mobile apps or webpages. Traditionally the objective has been the opposite; to make the mediation invisible with the intention of converging all the cognitive attention from the audience towards the mediated content. In cinemas they shut the doors and turn off the lights to hide all the appliances necessary for the mediation, like the projector, the architectural facilities and the other audiences. But simultaneously, a movie is a complex juxtaposition in itself, with its combination of editing, special effects, artificial sound etc. and is in this manner highly hypermediated. One crucial condition for perceiving media as transparent is the spectator’s former experience; if you are familiar with reading novels, nothing prevents you from being absorbed by the images and events unfolded by the symbolic letters. On the other hand, if you have never seen a printed book before, your attention will halt at the interface and not reach past the arbitrary meaning of the printed signs.

Bolter & Grusin describes how media always have oscillated between hypermediacy and immediacy, which means that our consciousness in one moment is directed towards the mediated content, and in the next switches to the act of mediation. The latter happens either by attracting attention to an interface, or by the way the content itself is combining multiple acts of representation. According to Bolter & Grusin, new media do not replace their predecessors but resembles or incorporate them. They call this *remediation*, and the new media’s intentions can either be to pay tribute to a former media, or to improve it.

If we take the study objects from this thesis as an example, they are animated short films made for 360 degrees viewing. Thus, it is reasonable to infer that this medium remediates animated shorts made for cinematic view. The medium has strong resemblances but have been given another purpose and additional features. With this linkage to its predecessors it tries to justify its own existence. This phenomenon does not only go one direction down the line of succession. Previous media might adopt and incorporate aspects of newer media as well. An example is the movie *Hard Core Henry* (Bekmambetov & Naishuller, 2015) which uses a first-person optical point of view through the entire movie. A more than hundred years old medium, cinema, is in this way incorporating features from more recent forms of expression, like First person-shooters and VR. But of course, if we trace the heritage further back, we can again regard First person-videogames as remediation of point of view-shots in film (Bolter & Grusin, 1999, p. 161; Galloway, 2006, p. 40-41; Nitsche, 2008, p. 93). As a matter of fact, the classic *Lady in the Lake* (Haight & Montgomery, 1946) already in the forties consequently utilized subjective camera settings similar to Hardcore Henry, foreseeing future media, like FPS and VR. A less explicit but more widespread example is when cinema integrates computer graphics for embedding animation and visual effects into live action footage (Bolter & Grusin, 1999, p. 153-154). The figure below shows the genealogic chain of remediation constituting *VR movies*:

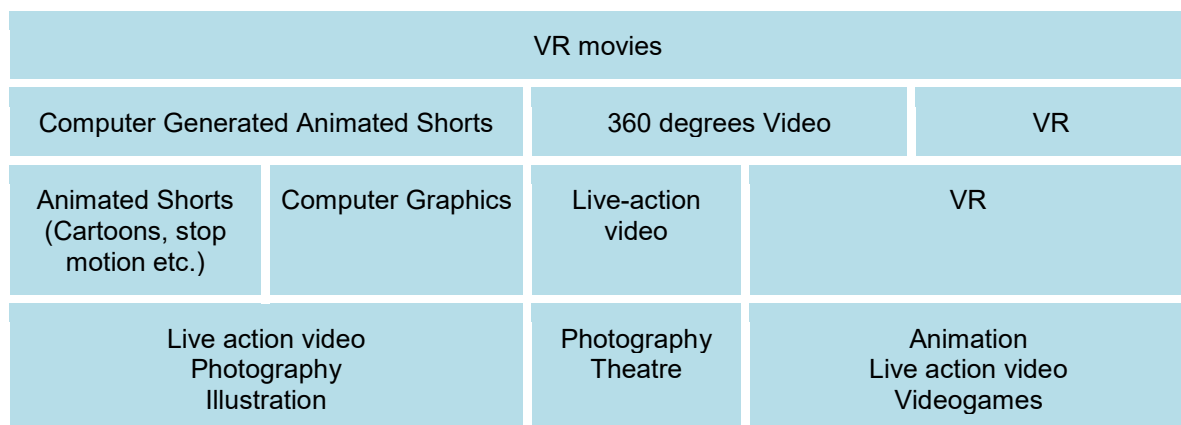


Figure 8: The genealogic chain of remediation constituting VR movies. Illustration by author.

Since VR movies obviously redeploy and reform traits from CG animated shorts, we can regard this as a remediation (Bolter & Grusin, 1999, p. 55). CG-shorts again, remediates non-CG animated shorts, like cartoons and stop motion. But CG animation is also a remediation of computer graphics which further can be seen as remediation of photography or, depending on visual style, techniques for illustration, e.g. watercolor, crayons etc. The “family tree” could

be arranged in multiple other ways and extended even further by analyzing in more detail the heritage of each aspect.

The complex fusion constituted by remediation leads to a tension between transparent immediacy and hypermediacy where both strategies for representation are simultaneously active. Over time however, the conventions, i.e. the stylistic and formalistic features of the medium can be internalized within the audience, and our experience makes us forget the arbitrary representation. In case of film, we embed the use of e.g. special effects into our perception of the storyline, and thus look past the layer of mediation and directly at the content (Bolter & Grusin, 1999, p. 39, 42, 53, 148).

Grau (2004, p. 13) emphasize that unlike earlier attempts in the history of arts and media, with VR we have finally found a way to enclose the spectator “hermetically” by altering the total visual information surrounding her vision. This might contribute to a more transparent mediation; we do not see the actual gadget used for representation, nor do we need to relate to an operative system like we have to with computers, tablets and smartphones. But of course, although the technology continuously improves, the absolute transparent immediacy of VR is to this date still only a theoretical ideal. First of all, only the sense of wearing an HMD makes it hard to neglect the act of mediation (Bucher, 2018, p. 33). The spectator might forget the weight of the mask and the clamping of straps after a while of use, but a certain awareness of the physical equipment will always remain. There might as well be flaws in the mediated content itself, like latency, not to mention unavoidable interface elements, like menus for navigation or superimposed icons and captions. All this will act as reminders of the mediation and thus prevent absolute transparency.

Despite opposing subjects, there is no doubt VR has brought us one step closer to total *transparent immediacy* where the objective is to conceal the interface and immerse into the content. A quick Google search on e.g. “VR reaction” will give you hours of video documentation on how strong the impact of this medium can be. Of course, the empirical value of random videoclips online is highly limited, but it serves well as an illustration on how VR can have the potential to affect people in a stronger way than other media.

5.1.2 The concepts of immersion and presence

The term *immersion* has been used frequently to describe experiences with VR- and 360 degrees technology. Murray (1997/2017, p. 124) explains that the term has its origin from the

feelings we are exposed to when our body is descended into water; the sense of being totally enveloped by alternative surroundings. Another term widely used to describe VR is *presence*. Originating from Minsky's *telepresence*, the word *presence* describes the perception of being, and interacting within, another space (Calleja, 2011, p. 18). It can be understood as a sensational and cognitive perception of inhabiting an alternative reality. A precondition is a perceivable representation of an alternative environment, wherein the user gets some kind of sensual feedback on her actions.

The unique ways of representing mediated content in VR creates a need for vocabulary to describe the experience. Unfortunately, the words *immersion* and *presence* suffer from an inconsistent usage; they have both lacked a unison, standardized meaning which makes it hard to use them as reference points in verifiable analysis of the medium (Calleja, 2011, p. 32). In the following sections I will describe some dominant understandings, and finally do an attempt on applying them to *VR movies*.

5.1.3 Immersion as technology

Slater & Wilbur (1997) regarded immersion as an "objective and quantifiable description of what any particular system does provide". Thus, they acknowledge immersion mainly as the technological affordances available for experiencing virtual environments, independent of the cognitive and psychological processes taking place at the human receiver's side (Calleja, 2011, p. 21; Slater & Wilbur, 1997). A realistic and believable representation could in this view convince the user that she has been transported to an alternative world.

We can imagine sometime in the future that the representations of virtual environments would be so crisp and lifelike, and replacing all our senses perfectly, that it actually *could* be possible. Not only sound and vision but also including smell, taste and haptic feedback for thermal sensation and giving the impression of real materiality, surface and weight when touching computer generated existents. Achieving total verisimilitude would also require complex artificial intelligence, as we would expect a reality to listen and behave according to our actions as well. For now, this is still science fiction and Calleja (2011, p. 33) averts seeing immersion as determined solely by technology. It *can* provide affordances, like *fidelity* but cannot alone give the user a sense of presence. Salen & Zimmerman (2004, p. 450) goes as far as calling it the *immersive fallacy*. They deny that vivid and lifelike representations combined with transparent immediacy entails a sense of immersion and argue that this is mainly caused

by a “complex interplay of meaning” between the user and the media. This leads to another view in the understanding of immersion.

5.1.4 Immersion as absorption

One division of theorists consider immersion as *absorption* (Calleja, 2011, p. 23). This view neglects the perceptual dimension in favor of the psychological. Here, the concept of immersion is detached from both the aesthetic qualities of representation and the hardware’s rendering capabilities. Instead it is caused by psychological states arising from the interactive process between the user and the media.

In her book “*Narrative as Virtual Reality*” (2015) Ryan discusses *immersion* from the perspective of literature. A written text can be capable of including the reader into the fictional scene by giving her a cognitive or imaginary impression of being close to, or even a part of the mediated content. Ryan specifies three modes of immersion; *spatio-temporal immersion*, *temporal immersion* and *emotional immersion* (Ryan, 2015, p. 98-119).

Spatio-temporal immersion can be achieved by reducing the temporal and spatial distance between the reader, the narrator and the narrated situation. Ryan mentions several means to accomplish this, e.g. addressing the reader through second-person to give a feel of recognition, detailed sensory descriptions, the use of present tense instead of past tense and so forth. There are many ways of decreasing the felt gap between what is being told and the one who listens. But she also emphasizes that these features should not be sustained over longer periods of time, as they will either wear off or be too intense. There will always be a need for variation (Ryan, 2015, p. 98-103). Compared to cinema, a movie with only close-ups might make the spectators exhausted.

Ryan’s *temporal immersion* describes the relation between *the reader* and how the unfolding of causal events is presented, i.e. *the discourse*. This mode of immersion is based on the reader’s interest and expectations and is achieved by portioning out certain amounts of knowledge at the correct time. It is a matter of establishing an emotional connection between the reader and either characters or story, and in this way get her emotionally engaged in the narrative (Ryan, 2015, p. 104-111). This mode of immersion is related to Bordwell’s idea of *schemata*, as discussed in chapter 4.

Emotional immersion can occur when the reader changes from seeing fictional characters as semantic devices to rather perceive them as pseudo humans. According to Ryan, there are

three types of emotions that can lead to immersion; *subjective reactions* to characters and their behavior, *empathy* and *self-centered emotions*. The first one involves a distanced judgement and can e.g. be to feel sorry for a fictional character who is in trouble. Empathy emanates from an identification with the character and understanding of the character's emotions. Self-centered emotions do not relate to any feelings of fictional character but is the reader's own personal reaction to the content, e.g. fear (horror genre) or sexual arousal (pornography) (Ryan, 2015, p. 111-113).

The term immersion, when used on literature, is for Ryan a "*mental phenomenon*", a mental absorption into mediated content (Ryan, 2015, p. 68). Absorption can be understood as a kind of engrossment or deepened engagement within the user. Calleja's objection to use this view on immersion for VR is that it would not solely describe ergodic media. Like Ryan shows, it would be a state that can be obtained by virtually any kind of media. Understood as *absorption*, you could be immersed into a written novel just as well as into a VR experience (Calleja, 2011, p. 18, 33).

5.1.5 Immersion as transportation

Immersion can also be understood as *transportation*; this occurs when the user gets a sense of being transported to another environment. For this to happen, the user must get a sense of actually inhabit the virtual space. For example, be provided with a representation of herself (e.g. an avatar), as well as the ability to navigate relatively freely around inside the fictional world. One confusing aspect of this definition of immersion is that it equals what other calls *presence* (Ryan, 2015, p. 60). Additionally, the conditions it is based on is quite technical which makes this definition as well tangent to *immersive fallacy*.

5.1.6 Human perspectives

When immersion is being used alternately for *transportation* and *absorption* this leads to a confusion, especially when different meanings are used within the same study (Calleja, 2011, p. 32-33). Solid and universal definitions of presence and immersion exceeds the scope of this thesis, but I will nevertheless explain what I put into these terms. I consider both presence and immersion as different states of consciousness, caused by combinations of phenomenal aspects.

First, immersion is often understood as *absorption*, which signifies a psychological mode within the user. As mentioned before, it is a product of a deep, cognitive involvement into the mediated content, even with the potential to mentally block out the surroundings. Absorption

cannot happen automatically but depends on an originating occurrence. I assent to the beliefs of Salen & Zimmerman, Gorfinkel and others (Salen & Zimmerman, 2004, p 450-452) that technology alone cannot totally alter someone's consciousness. It is also unlikely that any mediated content can be powerful enough to persuade the spectator that it is actual real. Both Coleridge's "*suspension of disbelief*" and Huizinga's "*magic circle*" describes the willingly and conscious act of pretending and play along with the premises set for a fictional representation (Hooks, 2011, p. 64-65; Huizinga, 1949/1980, p. 10-11, 20). The audience, readers or players are constantly aware that the media does not represent reality but anyway put all criticism and knowledge aside for letting the fiction fulfill its purpose. Murray even finds the phrase "the willing suspension of disbelief" too vague, believing it is rather an "*active creation of disbelief*" (Murray, 1997/2017, p. 136). By this, she means that our desire to surrender into a fictional world is so strong that we actively gather all our intellect and cognitive energy into, temporarily, accepting the fiction as truth. This corresponds well with Bordwell's idea on how the spectator participates in constructing the content by cognitively assembling the mediated with her own schematic data of expectations and former experience (Bordwell, 1985, p. 32). There is no doubt a conscious cognitive act is required to commit fully to media. *Absorption* thus depends on a certain degree of *make-belief*; a mental detachment from reality, and consequently surrender to the rules and premises of the media. Since immersion as absorption is being used by non-ergodic media as well it does not exclusively describe e.g. virtual reality. So, even though absorption and disbelief are prerequisites for immersion and presence in virtual reality, these aspects are not distinctly defining it as a medium.

5.1.7 Technical definitions

We have seen that immersion and presence demands some cognitive activity from the user. This again is caused by exposure to mediated content. Many people describe the terms immersion and presence based on the technical affordances needed to achieve a certain feeling or perception (Calleja, 2011, p. 17-34; Salen & Zimmerman, 2004, p. 31-33). In the figure below, I have tried to list some key aspects that might be relevant. I call this the *technical conditions for immersion and presence*:

	Technical conditions for <i>Immersion</i>	Technical conditions for <i>Presence</i>
Sensation		

Fidelity		
Transparency		
Encapsulation		
Involvement		

■ Precondition
■ Might increase the sense but not a precondition

Figure 9: Technical conditions for immersion and presence. Illustration by author.

When speaking of media, there must always be some sensory stimulation provided by the hardware, which makes *sensation* a necessary criterion for both immersion and presence. *Fidelity* is the media technology's ability to represent a vivid and precise experience, e.g. by high definition graphics and low latency. High-fidelity might increase the possibilities for a sense of immersion but is not at all mandatory. As Gorfinkel (2000) points out, you can be immersed in simple abstractions like Tetris as well (Salen & Zimmerman, 2004, p.451-452). I do not believe fidelity is precondition for presence either. Experienced users of media learn to ignore and look past the layer of mediation, and there are means to compensate for e.g. low-resolution graphics or arbitrary content.

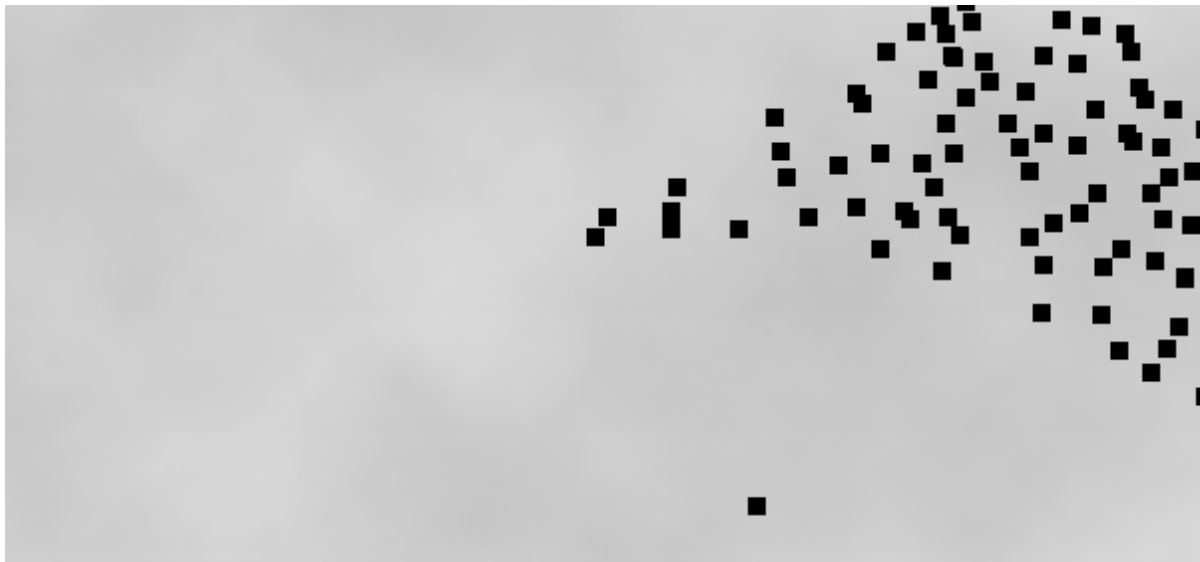


Figure 10: Screenshot from *Loneliness* (Magnuson, n.d.).

In the online game *Loneliness* (Jordan Magnuson, n.d.) we are controlling a tiny square approaching groups of other squares. Except these squares and their motion, the game world is totally blank. But the ability to move one of the squares gives a sense of being there. Calleja (2011, p. 61) declares that “the most intimate link between a player and even the most unlikely-

looking avatar is movement”. And since the other squares have similar design as the one we are controlling, we accept them as other people. Without the agency to move the square, this connection would never be established. But since we both are recognized inside the virtual world as an avatar square, and are provided with extended spatial navigation, there is a chance of feeling present. Derived from this, fidelity is not a mandatory condition for neither immersion nor presence.

According to Bolter & Grusin’s double logic of remediation, media will always oscillate between *hypermediacy* and *transparent immediacy*. This is especially compatible with digital media but applies to most former analogue media as well. Thus, a total lack of hypermediacy is not possible but any arbitrary aspects of the technology can over time be internalized with the user. In this way, the user can learn to look beyond mediation and focus all consciousness towards the content. This is a precondition both for immersion and presence. Though hypermediacy will always affect the mediation, there must be a *perception of transparent immediacy* within the user.

By *encapsulation*, I mean that at least one of the senses is blocked from perceiving reality, what Grau described as “hermetically” cut off. For VR this is done by the HMD which covers our entire vision with small screens. Immersion is widely used for non-ergodic media as well, such as cinema and literature (Calleja 2011, p. 18; Ryan, 2015). These kinds of media do not provide encapsulation but are still said to be immersive. But to feel present somewhere requires that you do not feel present somewhere else. So, for presence, encapsulation is essential.

To get a sense of inhabiting a virtual world there must be signs of your presence sent back to you. Except on the imaginary level, this cannot happen by reading a novel but can happen in case of ergodic media. Video games encourage *involvement*, which again give the user influence over the representation. For 360-degrees videos the involvement is usually restricted to where to look but this also leads to a certain agency regarding how the content is represented. The ability to influence your surroundings is strengthening the sense of being there but it is also possible to feel present if you can get the perception of moving around within a virtual environment.

5.1.8 Presence and immersion summarized

As we have seen, immersion is problematic as a term because of the diverse understandings of its meaning. The fact that it has been used in diverse fields is making it even harder to utilize in expressing phenomena in a precise and objective way. I believe the main difference between immersion and presence is the sense of being somewhere else. Not only on an imaginary level but by getting feedback from the mediating system that it, to a certain degree, recognizes your activities. There must be some monitoring of your actions, like motion tracking via a motor interface, and this monitoring must again be acknowledged and transferred as signals back to us through a sensorial interface. An even stronger sense of presence can be achieved by adding continuous spatial navigation; the ability to roam around in the virtual world, more or less freely. I see immersion and presence as both parts of a continuum as illustrated below:

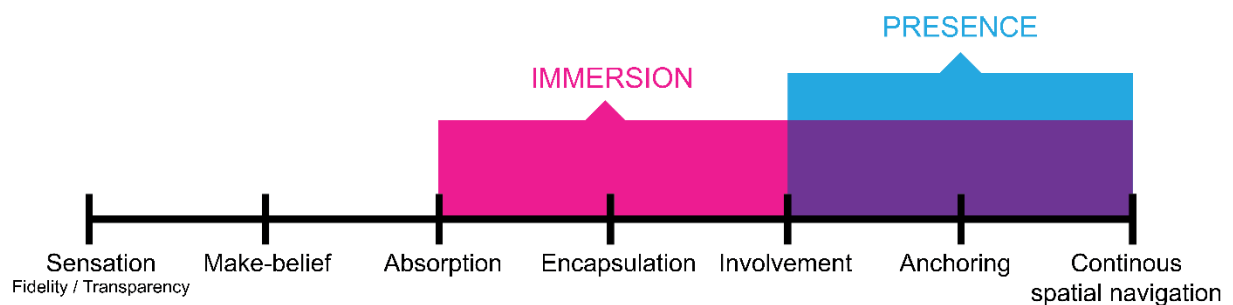


Figure 11: Immersion-presence-continuum. Illustration by author.

The colored markings illustrate within what area the sense of immersion and presence can be active. Everything left of each must be accomplished before the actual sense might occur, and sensation requires a medium. Immersion starts with absorption and gets stronger with encapsulation and involvement. Presence starts with involvement and gets more intense the further we move in the direction right. *Anchoring* implies that the spectator in some way is represented inside the virtual world, e.g. with an avatar. I will look at an example of the latter in the next chapter, when analyzing the VR short film *Invasion!* (Fan & Darnell, 2016).

6. Analysis of Invasion!



Figure 12: Image retrieved from Baobab Studios (n.d.).

6.1 About the film

“Across the gulf of space, minds that are to our minds as ours are to the meekest and most vulnerable piece, that easily perish on earth. Intellects, vast and cool and unsympathetic, regarded our planet with envious eyes, and slowly and surely drew their plans against us.”

(Fan & Darnell, 2016).

This introduction voiced by Ethan Hawke and accompanied by an image of the Earth seen from space express an obvious homage to the science fiction classic *War of the worlds* (Pal & Haskin, 1953) based on H. G. Wells’ famous novel. From the director of *Madagascar*, Eric Darnell, *Invasion!* is one of the earliest cinematic experiences for VR. It is also the first one I watched through an HMD (the first-generation Gear VR back in 2016).

Invasion! is produced in California by *Baobab Studios*. It was released at the Tribeca Film Festival, April 2016, and received a *Daytime Emmy* for *Outstanding Interactive* the following year (Bucher, 2018, p. 214-215; Internet Movie Database, b; Roettgers, 2016). The movie is made specifically for 360/VR and is available on the most of contemporary HMDs. I have not found any information about the film being edited to a non-ubiquitous format, e.g. 16:9 with predefined camera framing. But it is published as 360 degrees video on *Youtube* (Baobab Studios, 2016) where it has more than 600 000 views (registered 2019.04.21).

Invasion! has three characters, a bunny and two aliens. From the introductory voiceover we understand that the aliens have sinister plans, presumably conflicting the bunny’s (and every

other Earthly species') needs. Besides this character lineup there is one additional character, namely the spectator herself, which has been offered an avatar within the movie. I will get back to this in the following sections but begin with a short summary of the narrative events.

6.2 Synopsis

A bright little rabbit, named Chloe, lives a quiet life in the wilderness when suddenly she is encountered by two, hostile but goofy, aliens landing their spaceship on the frozen lake right next to her cave. Even though their appearance is quite silly they expose dangerous strength as they burn a roving eagle to ashes with laser beams. They are also threatening *us*, the spectator and Chloe, with their beams and at one point the situation looks alarming. But, after first being scared by the intruders, the resourceful rabbit jumps up and circles around them while their laser beams trace her movement. She avoids getting hit and the only result is that the ice is sliced around the aliens, causing them to slide and sink into the cold water. After they manage to get back up, they have realized their defeat and returns to the spaceship. Finally, they take off back to space and the peace is re-established (Baobab Studios, n.d.).

6.3 Film form in Invasion!

The synopsis above helps us extracting the essential characters and events forming the story of Invasion! We can regard *the first act* as the time before the aliens arrives. This is *The Ordinary World*: a little rabbit, Chloe, lives a quiet life in the wilderness. She is safe from harm except occasional encounters with predators, which she brilliantly handles with swiftness. The arrival of the alien spaceship introduces *the second act*, and this marks a shift to *The Special World*. The moment when Chloe first gets a glimpse of the approaching vehicle in the sky can be considered as her *Call to Adventure*, and the actual landing might be *Crossing the First Treshold*. During the second act the characters will, in many movies, be confronted with *Tests, Allies and Enemies*, which applies here as well. The threatening aliens are putting Chloe's courage to the test, forcing her to hide behind the spectator's avatar. Chloe's act of hiding, and thus not take action against the invaders can be regarded as a *Refusal of the Call*. This is also where Chloe is *Approaching to the Inmost Cave*; she is gathering her forces preparing for *The Ordeal*. According to Vogler, *The Ordeal* can be characterized as a *crisis*; Chloe's life is hanging by a thread, and it seems like there is no way out. Vogler states that this part of a story very often deals with the protagonist in some way are facing or cheating death (Vogler, 2007, p. 155-172). *The climax* of Invasion! might be when Chloe is forced to

intervene and defend herself (and us) against the aliens. In many movies this is where the hero is facing her most challenging battle, and victory will lead to her *Resurrection*. Finally, the aliens retreat, and Chloe returns to *The Ordinary World*. The Earth is no longer endangered, and Chloe might have brought with her an increased self-confidence as an *Elixir* from *The Special World*.

As for archetypes, we can regard Chloe as *The Hero*. She definitely has heroic qualities, like sacrificing herself to save others in the climax. But what distinctively separates *The Hero* from other characters is that she functions as a “window into the story” (Vogler, 2007, p. 30). The Hero is rendered more elaborate than other characters, with traits the audience can identify with. Chloe gets scared when the aliens arrive, something we can fully relate to. Character flaws add depth and realism to a character, making her actions more trustworthy. Chloe has other universal qualities as well, like curiosity and humour. Vogler further states that this character in most cases will go through some kind of personal growth. Chloe is overcoming her fear against the extraterrestrial strangers, which might prove as an example of this. Chloe is also the most active character with the most screening time, and the one confronting death in the climax. According to Vogler, this mortal showdown is a defining aspect of both narratives and heroes, though it does not have to be literary, like in *Invasion!* but could also be metaphorically, like the “death” of love in a romantic comedy. As mentioned, one character can serve several functions during the course of a story. Besides being *The Hero*, Chloe occasionally functions as *The Trickster* as well. She outwits the aliens in a funny way, topping it with a comical voiceless growl to further scare them as they crawl their way up from the cold water.

Being the villains, the alien characters obviously have the function as *The Shadow*. They represent antagonistic forces with motives opposing the *The Hero's* welfare. According to Vogler, humanizing the shadows e.g. by giving them some character flaws or universal character-traits, adds depth and credibility. The aliens of *Invasion!* are clumsy and entertaining, like silent movie slapstick-actors, which might prevent them from being mere stereotypes (Engelstad, 2015, p. 65).

As we can see, the narrative form of *Invasion!* is undeniably following the same principles as traditional movies. But according to Bordwell's model discussed in chapter 4, narrative in films also depends on film style, encompassing *Mise-en-scène*, *cinematography*, *editing* and *sound*. In the next section I will go through how this is executed in *Invasion!*

6.4 Film style in Invasion!

6.4.1 Cinematography

In general, *cinematography* deals with all qualities related to the camera apparatus, from positioning and movement to technical photographic aspects. The visuals of *Invasion!* is assembled with *computer graphics*, thus no physical camera is involved (Bolter & Grusin, 1999, p. 105; Nitsche, 2008, p. 90). The rendering is similar to its predecessors; mainstream cg-animated films aimed at a family audience, usually associated with productions from Pixar, Dreamworks and so on. The textures are semi-realistic, the hues are well saturated, and the overall exposure is balanced.

A key aspect of cinematography is *framing*, which regards the decisions of what to include within the frame of a picture, and their distance and angle to the camera (Bordwell & Thompson, 2013, p. 178). Which existents get an entry into the frame, and how they are represented, can be crucial for how the spectator perceive the events and characters, which again influence how she will construct the *story*. A story is always occurring in time and space, and framing is mostly dealing with the latter. As mentioned in chapter 4, *story space* equals the total diegetic space. The spectator has perceptual access to only a fraction of this at any time. As a matter of fact, most of the story space is usually an imaginative construct based on cues offered by the film (Bordwell, 1985, p. 102; Bordwell, Staiger & Thompson, 1985, p. 214). But all that *is* represented visually for the spectator is called *explicit story space*, meaning what is actually shown within the framed picture. With its 360-degrees view, this is extended in *Invasion!* compared with cinema's predefined framing. The spectator has access to the complete fictional scenery encircling her, but there are of course limitations. The spectator is bound to a *predefined* vantage point. Although she can alter this by her own real-world movements, it is limited to the *room scale*, since *Invasion!* do not offer teleporting. Thus, the spectator has no other choice than staying within a delimited area on the frozen lake. Another limitation is that even though the spectator has *access* to a ubiquitous scenery, she cannot look in every direction simultaneously. If any events take place outside her field of view, she may consequently fail to notice them.

Predefined framing enables more constraining on how the events and existents will appear to the spectator, and what to focus on. In case of *Invasion!* and most other VR movies, the *discourse space* is to a great extent left for the spectator to choose. For story construction, this leaves a possibility for the spectator to miss out on action. For example, looking away when

Chloe approaches the aliens, will hinder the comprehension of why the aliens suddenly are gone. This emphasizes the importance of cuing the spectator's gaze by other features than framing; e.g. *staging of action* which will be the subject of the next section.

6.4.2 Mise-en-scène

MISE-EN-SCÈNE: STAGING

Invasion! broadly utilizes staging of action to compensate for the lack of predefined framing. An example is the moment right before the alien arrival, around 02:10 into the movie. Chloe is here suddenly shifting her attention away from the spectator, turning around and looking up at the sky. She is holding this pose for approximately twenty seconds, only with slight turns to adjust correspondingly to the position of the flying item she is following. Her actions anticipating extraterrestrial visitors is held for a remarkably long duration, which might be the film's way of ensuring that the spectator do not miss this event. Chloe's persistent glance toward the sky is cuing the spectator to look in the same direction as well, so the crucial moment will not go unnoticed.

Another important part of staging in a 360-degree view is the *staging in depth*. Including the prologue, the first two minutes of Invasion! leaves the spectator distant from all the action. At first, we are floating somewhere in outer space, observing the spaceship flying by, headed towards Earth. Secondly, we are remotely watching the rabbit as she steps out of her shelter, and then jumps quickly back in when the eagle passes by. This part of the movie resembles *primitive cinema*, as mentioned in the introduction. The narration in these movies was unsophisticated in the way that it was all taking place inside a single camera view, often seen from a distance. The objective was to capture all the necessary action within *one* single pictorial frame and *one* take, therefore every significant action needed to be easily comprehensible (Bordwell, Staiger & Thompson, 1985, p. 174). Bordwell, Staiger & Thompson compare this with how a stage is seen by the spectators at a theatre set. They also mention how this practice refrained from utilizing the space between the spectator and the action, leaving a vacant gap between them. When all the action is proceeding within a delimited area witnessed from a distance it does not imply any extensively diegesis. But staging in VR is not limited to the floor of a theatre stage; actors can in principle move everywhere, even down to the pit where the spectator is sitting.

In the first part of Invasion! the spectator is placed distant from the action, a viewer-position holding strong resemblances to primitive cinema (Figure 13, left). But around two minutes

into the film there is a change, when Chloe jumps closer to the spectator's position (Figure 13, right).



Figure 13: Screenshots from *Invasion!* (Baobab Studios, 2016).

Bordwell, Staiger & Thompson (1985) remarked one major change, regarding narrative space, from *primitive* to *classical cinema*. With the introduction of the latter, it became more common to populate the space between the spectator's vantage point and the action with either characters or other elements. By distributing the staging of elements in layers of depth, the filmmakers avoided the empty foreground space that was detaching the spectator from the action in primitive cinema. By this, film no longer mimicked the architectural boundaries between the theatre stage and the audience; the diegetic space was extended to "include the viewer" (Bordwell, Staiger & Thompson, 1985, p. 214-216).

In *Invasion!* this inclusion might be felt even stronger considering the experience is what Ryan (2015, p. 48) calls "fully spatial". As discussed in chapter 3, 6DoF can provide a perception of the encircling existents as *volumetric*, instead of just two-dimensional representations. Thus, watching *Invasion!* with 6DoF allows for the sensation of inhabiting a *3D volume* populated by *3D existents*, and this is particularly evident when an existent, e.g. the character Chloe, is approximal. This does not directly influence the narration but can increase the spectator's sense of being in the midst of the diegesis and in this way arouse more engagement. According to Bordwell (1985, p. 53) constructing a story relies on the spectator's activity. That an experience like *Invasion!* is "fully spatial" is, in isolation, a non-narrative trait, but it might nurture the spectator's engrossment, and by this benefit the story construction.

Another way to include the spectator is by acknowledging her real-world presence from within the diegesis. By the way Chloe approaches the spectator's vantage point, her actions mimic interaction with another character. Since the field of view is controlled by the spectator's head movement, this can give the impression that the bunny is sniffing and looking at the spectator. The spectator's optical viewpoint does not go unaffected but has a certain significance inside

the fictional world. This is known from drama as *breaking the fourth wall*. The theatre, especially from the nineteenth century onwards, stated the convention that a play was unfolding inside four walls; three walls physically enclosing the stage set, one behind the actors and one on each side. The fourth wall is facing the audience and acts as an invisible imaginary boundary between them and the fictional world (Bucher, 2018, p. 64; Silbermon, Giles & Kuhn, 2015, p. 23-24). The general convention was that the actors were unaware of the audience and therefore are not able to e.g. talk to them, and this rule still applies in most fiction, like cinema or theatre. Nevertheless, some artists break this rule for several reasons. Brecht, with his so-called *epic theatre*, discarded the idea about creating a coherent fiction by interfering the illusion with alienating features. One of them was letting the actors speak directly to the audience (Silbermon et al., 2015). Breaking the fourth wall have many occurrences in tv-drama and cinema as well, e.g. in Woody Allen's *Annie Hall* (Joffe & Allen, 1977), where the protagonist suddenly looks straight into the camera, giving us the feeling that he is talking to us.

In *Invasion!* on the other hand, Chloe's approach to the spectator is designed, not to break, but to be part of the diegesis. She is not aware of being a fictional character but is simply communicating with a fellow diegetic native. This is proven to the spectator if she bows her head to look down. In *Invasion!* the spectator is equipped with a graphical representation of herself inside the diegesis, an avatar, in the form of the white body of a cartoony rabbit, designed similarly to the protagonist.

Since the spectator both can have an impression of being placed, "fully spatial", in the middle of the virtual environment, and is additionally granted with an avatar, breaking the fourth wall do not necessarily have the same function in *Invasion!* as for other instances. Chloe does not address the spectator in order to step out of the diegesis and into the real-world, but to pull the spectator with her into the fictional world. It is rather a way of acknowledging the spectator as an existent than a self-awareness of being a fictional character.

This is also repeated later in the film when the aliens are threatening Chloe and the spectator with their laser gun and Chloe is sheltering behind the spectator's vantage point. The intention here is to increase the suspense by putting the spectator directly in the line of fire. With this, her optical point of view is included in the action as a character. In the case of *Invasion!* the intention of breaking the fourth wall is not to dissolve the illusion, rather strengthen it by making the spectator part of the diegesis.

In cinema, staging is largely influenced by shot composition, a stylistic device abating with the 360 degrees view. To compensate for this, *Invasion!* use the characters actions for cuing our attention. When the characters turn to look at something, we get curious and turn our head in the same direction, avoid missing out on events, like the arrival of the spaceship. So even if we have the agency to look around, the film is discreetly trying to constrain this freedom by cuing our attention with cleverly laid out guides.

MISE-EN-SCÈNE: LIGHTING AND SETTING

Except a prologue and epilogue happening in outer space, *Invasion!* has only one location; a frozen lake in the middle of a mountain scenery. The mountains have sharp diamond-shaped silhouettes which brings associations to North American mountain ranges. The mountains serve as a distant surrounding backdrop, since the spectator's point of view is placed on an icebound lake. The set design is somewhere halfway between realistic and cartoony; the distant mountains and sky seems realistic while proximate elements, like rocks and trees, have slightly distorted and exaggerated shapes, a design-style commonly known from cartoons. So far, there is nothing that distinguishes the setting in *Invasion!* with that of an animated movie for cinema. Except, of course, that it is covering the spectator's total vision in 360-degrees. And this is exactly why VR-developers are talking about the *point of interest* (Tricart, 2018, p. 99-102). Without the ability to predefine a camera setting, VR and 360-degrees film need to utilize other features in order to narrow down the *discourse space*. One way is the staging of events, as discussed in the previous section. Another is configurations of the lighting and setting.

In *Invasion!* the spectator's field of view is cued by, among other things, a cleverly distribution and arrangement of existents in spatial relation to the spectator's field of view. To explain this with an example; somewhat closer to our gaze are clusters with large rocks accompanied by minor accumulations of weathered trees. One of these clusters is especially close and at the front there is a tiny path made of smaller rocks leading to a little cave entrance. This might take the advantages of the cognitive activities Bordwell (1985, p. 37) ascribe the human spectator. For example, we might assume that since there is a cave, there might be someone or something inside. It is legitimate to believe that an assumption like this will arouse curiosity among most people. To accentuate the cave even further, it is placed in the shadow of an old tree, letting only spots of sunlight passing through the branches. This gives the pile of rocks a more contrastingly balance between light and shadows, than the rest of the evenly high-key lighted scenery, making this significant area pop out from the rest of the surroundings. This

might again cue the spectator to look in this specific direction, instead of gazing somewhere else and miss the action following.

MISE-EN-SCÈNE: COSTUME AND MAKEUP

The visuals in *Invasion!* are all computer generated, which makes it reasonable to look at costume and makeup as *character design*. As mentioned, the design style of *Invasion!* bears strong resemblances to animated cinema blockbusters. The characters' main shapes are formed out of basic geometrical shapes with exaggerated proportions and large, expressive eyes to increase appeal.

McCloud (1994, p. 24-59) states that abstraction and simplification increases universal identification. An example of this is the character design of Mickey Mouse which springs out of likeness but is abstracted and simplified into a concept, rather than being an actual iconic representation of a mouse. With no necessary relation to the signified, there are of course unlimited ways to design a character. Still it seems to exist a certain degree of unification regarding the look of animated characters within Western mainstream culture.

There are certainly many reasons for this, and a full investigation exceeds the scope of this thesis. But great influence from a few leading studios and countless handbooks written by the same studios' ex-employees, like Tom Bancroft, Preston Blair and others, may have contributed (Bancroft, 2006, p. 52-53, 67-68; Blair, 2006). These predominant design style conventions can probably be traced back to the so-called *Golden Age of Animation* in America from the introduction of sound cartoons and some decades beyond (Maltin, 1987). This might explain why we perceive the images below as a natural way of representing a rabbit, though the deviations from a realistic render of the signified are considerable.

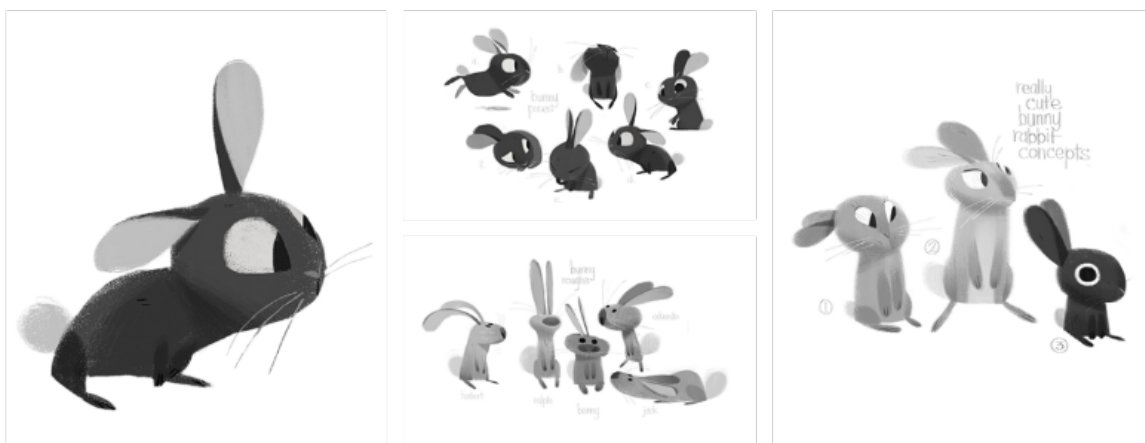


Figure 14: Concept art from *Invasion!* (Baobab Studios, n.d.).

For *Invasion!* this choice might have a reassuring effect on the spectator. Being introduced to a new medium where you are sensationally thrown into another world could be breathtaking enough, if you do not need to grasp any design-wise avant-garde as well. Simplistic, familiar design might also be easier to accept than photorealism. First, because of McCloud's arguments around stripping it down to a symbolic concept, making it easier for people to involve and identify with. Second, to avoid the *uncanny valley*; a term commonly used to describe the descent of affinity with a representation, when an almost indistinguishable resemblance to reality still holds minor deviations (LaValle, 2017, p. 7; Nitsche, 2008, p. 21). Conventional design in addition to drawing off other connotations like the hero is colored white and the antagonist colored dark can be seen as an attempt to repurpose cultural ideas and expectations into another medium, an act of relenting the radical uniqueness and make it more familiar for the untrained spectator (Bolter & Grusin, 1999, p. 50). One of the characteristics of remediation is an appropriation of former media in order to be accepted as transparent (Bolter & Grusin, 1999, p. 44-46). Though, VR is highly hypermediated, films like *Invasion!* attempts to tear down the layer of mediation, e.g. the silver screen, and immerse the spectator into the diegesis. This might be more easily achieved if the diegesis looks familiar and trustworthy.

6.4.3 Editing

Invasion! is sparsely edited and consists of no more than three shots; the main part, taking place on a frozen lake somewhere on Earth, enclosed by respectively a prologue and an epilogue happening in outer space. The main part is where the most action takes place. For about three and a half minutes (approximately between 01:10 and 04:45) the camera does not shift position. Though the spectator can alter the view by turning her head, we can consider this as a single long take shot as we are consistently located in one spot on the frozen lake.

The long take has been widely used through the history of cinema. It was almost the standard during the already mentioned primitive period due to montage and editing still waiting to be discovered. It then had its revival in the 1930s where directors like Renoir, Hitchcock and Welles utilized advanced mobile camerawork to create well-planned and creative mobile sequences in one single take (Bordwell & Thompson, 2013, p. 211-213). Theorists like Bazin also argued that single long takes enhanced realism by preserving the spatial relation between the existents, thus giving the spectator more agency over perception and interpretation (Bazin, 1967, p. 25-26, 52). Burch on the other hand, admired the way Mizoguchi totally depleted a shot for content before he decided to cut (Burch, 1969/1981, p. 89). With time, the long take

has been occasionally both utilized and praised within cinema, but the overall trend seems however to be decreasing shot durations (Bordwell, 1985, p. 168, 186, 238-239).

Cutting & Candan (2015) did a research on *shot duration* in movies released between 1912 and 2013 and found a remarkably decline, especially in English-language movies from 1940 and beyond. They argue that audience over time might “have become more efficient at extracting information from the visual narrative” (Cutting & Candan, 2015, p. 57). Cutting & Candan mention the influence of music videos and interactive multimedia as one feasible cause. I do also believe new media practices are altering both our expectations and manner of consumption. When exposed to a constantly increasing flow of mediated information we are exercising our ability to quickly sort and process impressions, what Hayles (2012) calls *hyper attention*. This is an innate capability but repeatedly utilization might over time change our way of perceiving. Hayles argues that the brain’s plasticity makes us capable of adjusting our attention strategies to altered surroundings, and that these changes can be transmitted to the next generation by epigenetic inheritance (Hayles, 2012, s. 11-14, 56-59, 69). The findings of Cutting & Candan does not necessary confine to be a change in style, like an aesthetic trend, but might as well be a precondition to accommodate a genetic change in the audience’s attentional expectation and need. So why would the team behind *Invasion!* then resort to a slower pacing in a 2016 production?

First, I think one answer is the ubiquitous visual information one must handle within a 360 view. In case of *Invasion!* we can compare the scene at the lake with a long shot. Normally these shots contain a larger amount of visual information, and they are therefore assigned with longer durations, giving the spectator more time to perceive and sort the details (Mercado, 2010, p. 59). In traditional cinema, *establishing shots* are often arranged as *long shots* or *extreme long shots*, to present the setting and set the spatial relations for the audience. Examples are the opening sequence of Kubrick’s *The Shining* (Kubrick, 1980) showing aerial shots of Glacier National Park, or Scott’s *Blade Runner* (Deeley & Scott, 1982) distantly presenting the cityscape of a future Los Angeles. Both examples leave the audience with enormous and visually complex landscapes that must be taken in. Since this kind of framing usually contains more visual information to absorb than e.g. a close-up, the shots are held for longer durations of time. For 360-degrees the visual information might be even more copious which would make cutting additionally overwhelming. Watching *Invasion!* through an HMD transports the spectator to a place she has never been before. The complete vision is replaced by an unfamiliar mountain scenery which naturally takes some time to grasp. An instant

change of the entire vision might lead to a vigorous disorientation which might be a reason for using a single take.

A second reason might be the interactive mobile framing offered by the motion tracking of the HMD. The filmmakers will never know exactly what part of the scenery the spectator will capture, or in what way and how fast the virtual camera will move at any moment. The prologue of *Invasion!* comes with a warning of an imminent alien attack. Thus, the spectator is cued to expect something to happen in the main part and will probably search around for any sign of action. Already in 2001, Manovich noted a resistance to montage in digital media. The ability to select and composite experiences leads to different strategies for achieving continuity, replacing the abrupt cut. Unlike assembling a sequence of separate pieces, e.g. shots in a cinematic montage, new digital media aims to merge all the ingredients together as a continuous whole. This applies to a wide range of digital media; GUI of operation systems, video games, and of course VR (Manovich, 2001, p. 141-144). *Invasion!* leaves the whole picture to the spectator's disposal. Most likely our gaze will be cued towards animated action but e.g. when the eagle swoops down for prey and misses, the spectator might choose either to follow the eagle taking off back into the sky or the rabbit returning to her safe shelter. This would result in two totally different pictorial compositions out of an unlimited number of other possibilities which makes a sudden shift to another "shot" feel arbitrary.

Though the main part of *Invasion!* is a single take, there *is* cutting before and after. The main part is separated from the prologue and epilogue by a huge spatial shift. But the use of fade in and out from black makes the viewing experience smoother, as well as separates the shots more distinctively, avoiding bewilderment. Of course, it *is* possible to cut in VR. You might not do e.g. a *match cut* like the famous time skip in *2001: A Space Odyssey* (Kubrick, 1968) where a space station supersedes a bone, since the spectator most likely will not frame her field of view correctly at the exact moment. But *cutting* has been done in several VR films, like e.g. *Son of Jaguar* (Bodyfelt, Eisenmann & Gutiérrez, 2017), and, quite extensively, in *Pearl* (Eisenmann & Osborne, 2016), the latter which will be discussed in the next chapter.

Derived from all this, we can find several adequate justifications for choosing a single long take on behalf of editing in *Invasion!* As we have seen, a 360 degrees-view can in some cases make editing superfluous, and even confusing (in relation to causal comprehension of the montage). Some features of editing originally sprung out of an ambition to place the spectator in the midst of the action, increasing the sense of absorption and emotional participation in the

narrative. With a 360-degree view, some of these features are no longer necessary. Classical continuity editing supported the spectator's spatial orientation. The shot/reverse-shot is an example of placing the spectator into the set among e.g. two characters talking to each other. This is a simulation of actually standing inside the diegesis, looking back and forth between the two characters (Bordwell, Staiger & Thompson, 1985, p. 55-57). Since the cinema audience cannot alter the field of view, this has to be predefined, e.g. by editing. VR movies on the other hand, enables the spectator to shift the field of view. In *Invasion!* there is a confrontation between the rabbit and the two aliens. Here it would be redundant to use shot/reverse-shot editing back and forth between the rabbit and the aliens because the spectator at any time can look at whom she wants just by turning her head.

6.4.4 Sound

Except the voice of cosmos narrated by Ethan Hawke *Invasion!* has no dialog, but two alien characters are communicating through what could be described as *gibberish*. This is widely used within animation, well-known from classics like *La Linea* and *Pingu* (Internet Movie Database, i, j), and in this particular case manifesting a, literary, alien language.

Like many other movies, sound is in *Invasion!* used widely for cuing our attention by anticipating characters or events represented visually. For example, a loud, squeaky sound is followed by an eagle passing by, and the loudness of the engine-sound is synchronized with the spaceship's distance to the spectator's point of view (Bordwell & Thompson, 2013, p. 268-271). Since the spectator of *Invasion!* cannot transcend the delimited room scale, e.g. by teleporting, the sound does not utilize VR's ability to spatially distribute audio sources within a virtual volume. By this, Foley sound in *Invasion!* do not indicate distance and position more precisely than a traditional movie in cinema.

Another heritage from cinema, is the musical scoring. A soundtrack is usually nondiegetic, and one of its common purposes besides filling in the "emptiness", is to set the spectator in a certain mood. One example is the way John Williams' theme from *Jaws* (Brown, Zanuck & Spielberg, 1975) can evoke a feeling of eeriness within the spectator. The same applies to *Invasion!* The production uses symphonic orchestration to achieve a sense of suspense, and the passages are laid out to underscore the dramatic events, e.g. when the spaceship arrives. The dramatic style stylistically resemblances soundtracks from the first decades after silent movie era. Like the voiceover, the scoring might be another tribute to the 1953 adaptation of *War of the Worlds* (Pal & Haskin, 1953), scored by Leith Stevens (Internet Movie Database,

e.), or inspired by other science fiction classics. E.g. the soundtrack of Star Wars (Kurtz & Lucas, 1977) was largely influenced by film composing from 1930's and 1940's, which has established this as a genre feature (Tonks, 2001, p. 12). Thus, when applied to a VR short, we can regard this as persisting genre conventions from cinema to make the transition to the new medium easier to grasp for the spectator.

6.5 Spatial presence in Invasion!

Besides being a short film, *Invasion!* sensationally lets the spectator step into the world of diegesis. The appearance of the existents is relatively cartoony and can easily be distinguished from reality. However, based on the discussions from Section 5, *fidelity*, in this case understood as photorealism or likeness to reality, is not a precondition for experiencing a sense of presence. Though it might in some cases improve the sense, fidelity and technology will not be the deciding factor. Cognitive absorption and emotional involvement do, however require an activity by the spectator. She must leave all disbeliefs aside and actively embrace the virtual for it to happen. Though *Invasion!* can be watched as a 360-degree render on e.g. Youtube, it is meant for HMD-screening. This blocks out the reality, which might lead to stronger absorption.

But the feature that distinguishes *Invasion!* from most of the other VR films I have seen, is that the spectator has an avatar inside the virtual environment. The spectator is represented visually with a rabbit body, and she is noticed and addressed by the other characters. However, the spectator does not have the agency to control this body. Today, e.g. the arms technically *could* be driven by hand-controllers but at the time of production this was not achievable, according to Baobab Studios Co-founder Larry Cutler (VLabvideos, 2018). Agency or not, it is likely to believe the avatar might have an affect regarding the spectator's sense of embodying a fictional character. But in isolation this is nothing unique for VR; *embodiment* can be achieved within traditional cinema as well.

According to film phenomenologist Vivian Sobchack, it is not possible to separate what she calls the *carnal sense* from our *conscious sense*, i.e. body and mind, as both modes of experiences are intertwined, and work together (Sobchack, 2004, p. 1-3). Our capacity of continuously utilizing all senses simultaneously give us a multi-sensual basis of experience, which we activate when encountering new sensations. By this, our "lived bodies" are able to recall corresponding senses from its accumulated sense-unified register when one sense is

affected. Thus, comprehension of meaning is not solely based on cognitive activities, e.g. triggered by visual and aural input, but is constituted in strong relation with the spectator's subjective basis of embodied experience (Sobchack, 2004, p. 59-61). This is why a spectator can actually feel pain when watching a movie character gets hurt.

This applies to VR movies as well, but here there is one additional feature that might even reinforce the phenomenon within this medium. A repeatedly conducted experiment exploring the relation between tactile and visual sensation is the *rubber hand illusion* (Riemer, Kleinböhl, Hölzl, & Trojan, 2013). In short, this is carried out by hiding the participant's real hand and replacing it with an artificial substitute. Both the real and the artificial hand are then synchronously stroked to establish a phenomenological connection between the participant and the artificial limb, causing her to sensually accept the substitute as her own. This is achieved by a phenomenon called the *proprioceptive drift*, which means that the participant gets the perception that her hidden hand has been moved to where the visible rubber hand is positioned (Burin et al., 2017, p. 43; Riemer et al., 2013, p. 384).

What *Invasion!* has in common with the rubber hand illusion, is the occlusion of the spectator's body. Even though there is no tactile stimulation involved, replacing the perceived body with an artificial at the same position, relative to the spectator's point of view, might cause a feeling of ownership over the rabbit body. In this way VR can lead to a different kind of embodiment, unifying the spectator's consciousness with the represented body.

In addition, VR's ability to represent a fully artificial environment allows for manipulation, not only in how the spectator perceives herself, but also on how she perceives herself in relation to the artificial world. Lanier has an anecdote describing one of his early VR experiments at the VPL Research lab in the late eighties. He was testing input devices for an application displaying a 3d model of Seattle, when he discovered a bug. The graphical represented hand corresponding with his real-world hand gestures through motion tracking had become enormous in relation to the city. According to Lanier, this moment changed his view, not only on virtual reality, but on physical reality as well. The sense of inhabiting something remarkably different than himself gave him a fresh look on the act of sensation, or with his own words an "improved perception" (Lanier, 2017, p. xi-xiii).

An article by Banakou, Groten & Slater (2013) argues for plausible changes in perception and behavior that can be derived from the sense of inhabiting a different body. Their study involves

exposing adult participants to a VR-experience representing them with a downsized virtual body, first a body of a scaled-down adult, then of a child. The size and proportions of the virtual environment's existents was adjusted relatively to give a full perception of being scaled down. They found that the sense of solely feeling small influenced how the participants estimated object sizes, but the results also indicated differences when participants inhabited another type of body, i.e. that of a child. Here the study, conducted by an Implicit Association Test (IAT), also detected changes in behavior and attitude.

This is largely recognizable from my own experiences with *Invasion!* At first in the movie, I am watching Chloe at a distance, and she appears just like a regular small bunny. But when she approaches my vantage point, she appears much bigger than I expected. Partly, this might derive from watching her at *eye level*, a stylistic feature often utilized to balance the status between the spectator and character, which can increase identification (Galloway, 2006, p. 41; Tumminello, 2008, 42). But with the HMD visually replacing the total real-world, the sense of scale is different than it would be with a close up-shot in cinema. In the physical world I am standing six feet above the ground, but my perception is to be the size of a little bunny. This is amplified when I look down and discovers my altered bodily proportions. According to the findings of Banakou, Groten & Slater this might change the way I perceive the experience of *Invasion!*

7. Analysis of Pearl

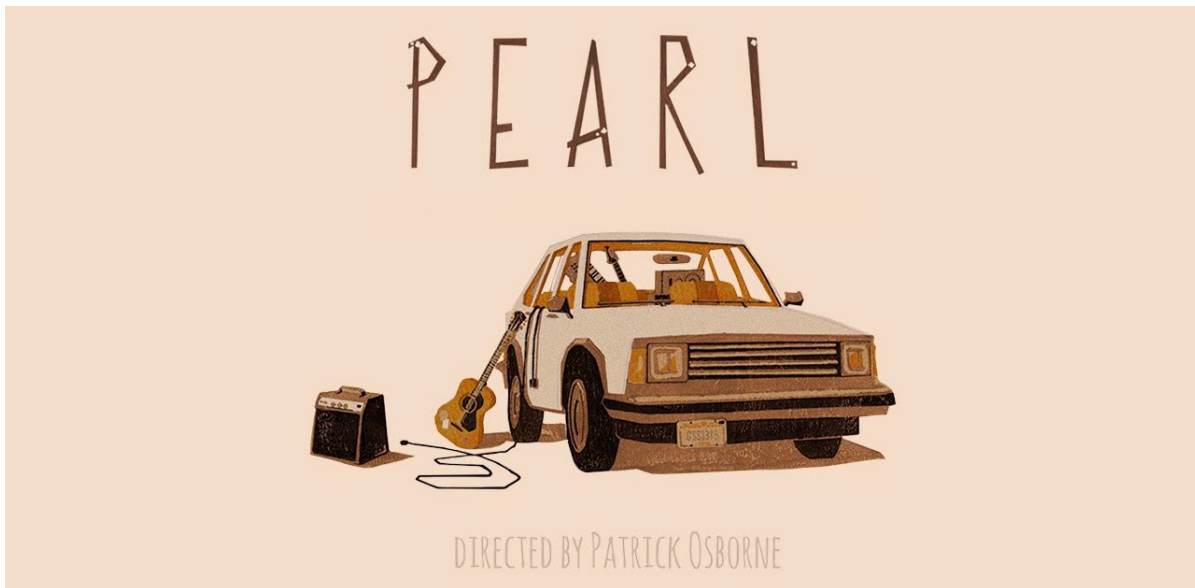


Figure 15: Pearl Press Image (Veer VR Blog, 2018).

7.1 About the film

Google Spotlight Stories was one of the projects arising from Google's *Advanced Technology and Projects group (ATAP)*; a subdivision of the Google company incubating projects mainly within technological research and innovation (Amidi, 2019; The Mill, 2015). During its six years existence, Google Spotlight Stories contributed with 16 short 360 degrees movies, developed to experiment and demonstrate technology and new ways to communicate stories. One of the most praised efforts is the 2016 film *Pearl*. The short is directed by Patrick Osborne, whose career as an animator includes notable titles like *Big Hero 6*, *Paperman* and *Wreck-It Ralph*. His debut as director, *Feast* (Reed & Osborne, 2014), won an Oscar for best animated short film in 2015 (Internet Movie Database, c.). *Pearl* is the first ever VR-film to be nominated for the Academy Awards, even though the nomination was mainly based on a 16:9 non-immersive edit (Opam, 2017). Additionally, the short have received a series of other prestigious awards and is regarded as one of the groundbreaking works within the medium (Sarto, 2017).

Pearl is a coming-of-age film where we get to follow a girl from childhood to adulthood. The protagonist, Sarah, spends most of her adolescence together with her father driving around in a boxy car from the eighties (Opam, 2016), and the vehicle acts as an anchorage for all the

events unfolding. The story is compressed into a total runtime just below six minutes and is represented through a third person point of view.

7.2 Synopsis

Childhood memories are awoken when a young woman, Sarah, is searching through an old familiar car. The main part of the movie is a flashback showing fragments of her upbringing from child, around four or five years old, to young adult. Sarah and her father, a vagabond folk musician, is continuously on the road, and it is inside the car we get to know them and follow their relationship. As a child Sarah seems happy with the freedom her father is offering her, and she is also included in his work as a street musician. But one Christmas her father is watching families with steady homes decorated for the holidays. He feels it is time to give up the vagabond life and settle down, to give his daughter a solid grounding in life. Sarah and her father move into a house, but they never manage to completely detach themselves from the life on the road, and especially Sarah is frequently drawn back to the car.

As a teenager, Sarah is opposing her dad and discarding his music, even though she secretly shows an increasing interest in playing herself. In this phase she and her father are drifting apart, and Sarah spends more time out with her friends. At one occasion Sarah even does not return home, causing her worried father to roam every street looking for her. Finally, he finds her, doing a street act to earn some dimes – just like they used to do when she was a child. This moment of reunion leads to a kind of reconciliation between the two. Not long after, Sarah is saying fare well to her father, who begs her to “be safe”. She then spends some time road tripping with her friends. The goal of this trip, if there is one, is not clearly expressed, but one night they end up at some kind of stadium. After a while the old car breaks down and is picked up by a tow truck, leaving Sarah and her friends standing by the road.

At this point the retrospective part ends, and we are put back into present; Sarah alone inside the old car. Out of curiosity she puts the key into the ignition, and to her surprise the engine starts. Right after, she picks up her old dad, and now the roles have turned; she is driving, while he is sitting in the back. The movie ends with Sarah driving the car through a city by night, with her father and friends in the backseat. They are passing flashing lights and crowds of people, making it reasonable to assume her music have made her a star and that the gathering of people are fans coming to see her.

7.3 Film form in Pearl

“There’s no wrong way home”, sings Nicki Bluhm and Kelley Stoltz in the score accompanying Pearl (Eisenmann & Osborne, 2016). This statement could also describe the endless possibilities for how screenwriters can get *The Hero* back into the *Ordinary World*. Even though the stages are equal in many stories, the number of available configurations and implementations are endless. In fiction, *The Hero’s Journey* can be barely metaphorical, like the protagonist’s inner travel from innocence to adulthood in *The Graduate* (Turman & Nichols, 1967). But many times, a story deals with physical displacement as well. The most common journey is the goal-oriented; Odysseus (Homer, 2017), and countless protagonists with him, struggles to return home, while Pixar’s *Up* (Rivera, Docter & Peterson, 2009), describes the protagonist Carl’s laborious journey to a better place, Paradise Falls. However, not all travelling has a determined destination. Within cinema, the *road movie* has become a long-established genre, where the reason for travelling is not always clearly stated. The same goes for Pearl where all the action is taking place inside a car but where destinations, if exists, are downplayed.

Since the protagonists are constantly on the road, travelling is their *Ordinary World*, which is the opposite to many other narratives where The Journey is a temporal condition for getting away from or back to a certain destination. While status quo for most people equals a settled existence linked to a specific place, for travelers, “home” is an ever-shifting non-space. Thus, *The Call to Adventure* can in Pearl be regarded as the moment when the father watches ordinary families decorate their homes for Christmas. Observing how other people live their lives can also be regarded as *Meeting with the Mentor*, as it provides him knowledge of how to interact within *The Special World*. This leads to a change in the protagonists’ lives; they are *Crossing the Treshold* and settles down in a house, switching over to a lifestyle more in line with the rest of the society. This new life, mundane and common to most people, is Sarah and her father’s *Special World*. It is obvious that especially Sarah occasionally is longing back to their former life, as she uses the car both as a playground and later for a place to be alone as teenager. The pull back towards the old car can be seen as an implicit *Refusal of the Call*.

In the Special World, Sarah and her father encounter *Tests, Allies and Enemies*. They both meet other people, which is enriching, but might also be compromising for their own relationship. Accommodating expectations from the other people and the society make them evolve in different directions, which again goes on the expense of their, one-time, close

relationship. As Sarah grows up to be a teenager, her father embarrasses her, and they do also have arguments around e.g. house rules, things that are both natural and common in most families. In Pearl, the *Approach to the Inmost Cave* might be when Sarah leaves her father in anger. Vogler (2007, p. 155) characterize *The Ordeal*, among other things, as the moment when characters are being confronted with their deepest fear, and it is probably the fear of losing his daughter that makes Sarah's father drive up and down the streets looking for her. Finally, when he finds her, their relationship is resolved, and we might see this as their *Reward*. Vogler (2007, p. 197) calls *The Resurrection* "the last and most dangerous meeting with death", and in Pearl this could be regarded as the moment when the car breaks down and is towed away.

As for Invasion! the story of Pearl fits well into a canonic format. In this section I have applied Vogler's model, but others could also work, e.g. the three-act structure, as there are many equalities and intersections between the two (Bordwell, 1985, p. 156-162; Vogler, 2007, p. 128, 159). But even though the underlying story of Pearl could fit within a cinematic movie, VR can bring other ways to conduct the discourse, and thus influence how the spectator perceives and construct the narrative in their mind.

7.4 Film style in Pearl

In Invasion! the spectator was given the body of a rabbit and could experience the events as a fellow diegetic character. This is not the case with Pearl; the spectator's vantage point is apparently severed from any represented existent, as well as being fully ignored by the characters. By this, Pearl is continuing the common practice from cinema, where the spectator has the role of an *invisible observer* (Bordwell, 1985, p. 9-10). But carried out in a 360-degree view, Pearl will probably manifest other deviations from traditional cinema. I will begin with looking at *Mise-en-scène*.

7.4.1 Mise-en-scène

MISE-EN-SCÈNE: SETTING

As for road movies in general, the setting of Pearl is to a large extent the vehicle and the highway (Laderman, 2002, p. 14). In the first act, the characters are constantly on the move and the landscapes are shifting rapidly. According to Laderman, *travelling shots* seeks to provide a sense of travelling at "a hyperhuman, modernized speed" (Laderman, 2002, p. 15).

The objective of these scenes is not descriptive documentation of a trajectory but rather to share the characters' perceptions and notions of travelling.

What separates Pearl, as a VR movie from a regular movie is the total substitution of the spectator's vision. The sense of motion derives from a complicated arrangement of sense organs within the human body, among other things the ears' vestibular system (Lanier, 2017, p. 124; LaValle, 2017, p. 54). An HMD will not let us physically feel motion through the body's accelerometers but LaValle (2017, p. 156) claims that we also largely use our vision to recognize motion. By using the classic cinematic device of a panning background inside a 360 degrees-view, Pearl is utilizing what LaValle calls *vection*, explained as the "illusion of self motion" (LaValle, 2017, p. 57). Usually developers try to avoidvection since it can cause the spectator to feel uncomfortable, derived from the conflict between what our eyes see and what our body feels (LaValle, 2017, p. 287). In Pearl however the effect is softened by placing the spectator inside a car chassis which has a stationary relation to the point-of-view. Then there exists some sort of anchoring to virtual existents, which will benefit the experience in two ways. First, it will decrease the amount of visual information rapidly shifting and thus be more comfortable and pleasing to the spectator's eyes, i.e. reducingvection. Second, it gives the spectator a representation of being transported to a certain place, which I previously (5.1.8.) argued for as one of the crucial aspects distinguishing presence from immersion.

The connection to a specified setting is also substantial when it comes to narration. Chatman (1978, p. 143) describes different types of relations that can occur between characters and settings within a narrative. A setting can strongly support the action, mirror the character's psychological states, or it could just serve as a necessary backdrop of the events unfolding. In general, the setting in Pearl is not connected to any specific geographical location. The *story space* includes a wide range of different environments observed as distant flashes from within the car chassis; initially the highway, then the suburban neighborhood they settle in, and finally a big city. Though the exterior setting is geographically corresponding with the underlying film form, i.e. Sarah and her father's *Journey*, it is not directly linked to any character emotion. For example, the father is not driving through a barren, rainy and hostile landscape when searching for his runaway daughter, in which the setting symbolically could reflect his current state of mind. In this way, neither the characters nor the spectator are particularly conscious of the exteriors.

The characters' old car, on the other hand, is utterly important. While the passing environments are more neutral, and in general provide a sense of movement, the *discourse space* is largely dominated by the chassis interior. This is how Pearl is anchoring the spectator inside the virtual environment, and the car do also bear strong relations to the characters and actions. As a matter of fact, the car shares many traits with Vogler's definition of *The Hero*; one of its main functions is to "protect and serve" and it is additionally our "window into the story" (Vogler, 2007, p. 29-30). This makes it a part of the setting with strong symbolic functions within the diegesis, as well as functioning as a fixed socket for the spectator.

MISE-EN-SCÈNE: LIGHTING

The lighting in Pearl in general simulates real life illumination, e.g. sunlight as the dominant source during daytime. With the main action all happening inside the car, this leads to the crucial events being wrapped up in shadow, while the outdoor environments are highlighted. This is pretty much the opposite of usual practice, as the filmmakers often tend to direct the key light towards the most important parts of the frame, cuing the spectator's attention (Bordwell & Thompson, 2013, p. 125; Bordwell, Staiger & Thompson, 1985, p. 20; Tumminello, 2008, p. 123). Simulating natural lighting mostly causes dim lighting inside the car, which might increase the sense of realism. Bordwell, Staiger & Thompson describes fifties filmmakers who strived towards a more realistic lighting, by utilizing low key lighting on behalf of artificial studio setups, e.g. high key three-point lighting (Bordwell, Staiger & Thompson, 1985, p. 20). The lighting in these films were motivated by natural sources, which also applies to Pearl where e.g. rim-lights along a character's silhouette springs from streetlights visible in the *Mise-en-scène*, rather than a studio backlight.



Figure 16: Still from Pearl (Google Spotlight Stories, 2016).

Though this is a technique inherited from cinema, it might have a stronger effect experienced within an HMD. Grau (2004) recites nineteenth century audience reactions of observing the panorama *The Battle of Sedan in Berlin*. The work was strategically placed in darkened surroundings with no light sources except one discreetly hidden light, indirectly illuminating the work itself. In this way the audiences' eyes were adapted to the surrounded darkness which made the panorama stand out by its luminous appearance. According to Grau, this evoked a sense of witnessing something real, and not only a work of art (Grau, 2004, p. 96-97).

The same illusionistic effect can be achieved in VR as well, caused by enclosing the spectator's vision by an HMD. The lack of comparison from the real-world, enables a VR-experience to habituate the spectator's eyes to different lighting setups, which again can be used to cue the experience (Bucher, 2018, p. 33; Grau, 2004, p. 83; Tricart, 2018, p. 131). But while the panorama example of Grau, or for that matter, a silver screen in the dark movie theatre, creates the effect by singling out a plane from its surroundings, like a self-illuminated window, an HMD let the spectator step into the window and be enveloped by the other reality.

Grau also touches upon how lighting often is applied differently in various forms of art. One example is the *panorama* versus *diorama*, where in the first, motives are usually brightly illuminated, while for the latter, these installations often work just as well faintly lit (Grau, 2004, p. 111). In Pearl, the passing backgrounds serves as well illuminated panoramas, while the car interior and characters function as a confined diorama for the spectator to inhabit. We can assume the spectator's eyes will accustom to the proximate, leaving the environment out as a bright, flashing backdrop, and cause a strengthened overall notion of inhabiting the car together with the characters.

MISE-EN-SCÈNE: STAGING

With all the events preceding within a car, this of course limits the possible configurations of staging. But if we follow Bordwell's cognitive theories, the spectator does not need to be omniscient; who is situated in the car at any time, and how the characters act and behave, gives us enough cues to fill in the gaps for what is otherwise going on in their lives (Bordwell, 1985, p. 33-40, 55). In Pearl, just the presence of characters and how they are seated is reflecting the underlying narrative. Roughly put, when Sarah and her father are both in the car and interacting with each other, at least by eye contact and gesture, there is a balance in their relationship. When they are silent, not noticing each other, or only one of them is present, they are usually wandering along different paths.

In the introduction I mentioned how VR often is pulled towards spectacle content. In that respect, Pearl is rather the opposite. While *Invasion!* offered exotic visitors from outer space, the universe of Pearl is more domestic and mundane. It tells a universal story about human relations that most people could experience in their real lives. But the way it is passed to us makes this experience different. Bucher claims that one of the things that makes storytelling in VR unique, is technical features offering different perspectives and points of view. He argues that “even stories that take place in familiar environments ... can be turned into new worlds with creative camera placement” (Bucher, 2018, p. 33). In Pearl, being an invisible observer inside the car can constitute an unfamiliar experience, even though most of us are familiar with the setting. I believe the reason is that when witnessing an event in third person perspective in cinema, the mediation is demarcated by the frame borders. This constitutes a distance which is perceptually erased in VR, as the spectator can get the sense of being surrounded by existents and events. In the case of Pearl, when the characters show no sign of being aware of the spectator’s presence, this can lead to a feeling of secretly observing them, like an invisible voyeur.

Laderman (2002, p. 13) points out how the small space of a car interior enables “elaborated dramatizing between characters”. He is talking about road movies in cinema, so if VR is able to amplify this, it might be caused by the ability to *enter* the world. Ryan (2015, p. 47-48) states that for this to happen, the world needs to be “*fully spatial*”. As mentioned in chapter 3.4, this implies that the spectator gets a credible perception of being among volumetric virtual existents. By this, the spectator senses depth and parallax in relation to her real-world locomotion and position among digital objects, instead of the prerecorded depth cues applied within e.g. cinema. In Pearl, the spectator can lean forward and see the characters from different angles or stand up and look out of the car’s sunroof. The existents appear to have *volume* and are perceptually more than only flat representations on a screen.

The sense of furtively observing an intimate, private space can be achieved within traditional cinema as well, for example the voyeuristic utilization of camera in Haneke’s *Cache* (Engelstad, 2015, p. 203). But in Pearl, the spectator additionally experiences a proximity with the characters, by perceiving them as volumetric existents. She is not watching events from a displaced position, e.g. a seat in the cinema auditorium, but is brought in the midst of where the events are unfolding, much like sitting in the middle of a *tableau vivant*. This can fuel the spectator’s make-belief of being inside the vehicle with the characters.

But contrary to *Invasion!* the spectator of *Pearl* is unrecognized by the existents. This, of course, is admittedly the most common existent-spectator relation within cinema. But the perceived sense of spatially being together with characters that do not take notice of your existence might cause an unfamiliar feeling, much like having turned into a voyeuristic ghost.

7.4.2 Cinematography

CINEMATOGRAPHY: CAMERA MOVEMENT

In cinema, there are different means to enhance “*realism*”, and one of them is camera movement. Bordwell & Thompson (2013, p. 198, 447) mention the use of *Steadicam* as one of the contributions to the authentic feeling of Scorsese’s *Raging Bull* (1980). Hand-held cameras have often been used to make scenes appear more “realistic” (Bolter & Grusin, 1999, p. 192; Bordwell, Staiger & Thompson, 1985, p. 349). One reason might be that since the cameras usually is carried by people, the output is motives, camera angles and positions, that are naturally accessible to us in the real-world, contrary to e.g. complicated crane shots. This might lead to a sense of being at the location and might even be strengthened with the use of *shaky camera* (handheld cameras without stabilizing devices) where the camera movements originate from human locomotion (Bordwell & Thompson, 2013, p. 197-198). In 6DoF VR, this is a perpetual condition as the framing correlates the positional tracking of the spectator’s movements. The difference in application is that while in cinema the hand-held camera-movement is pre-recorded, in VR it is real-time and synchronized with the spectator’s real-world spatial position. By this, I argue that there is an even greater chance for accepting the camera-movements as realistic, since there is no contradiction between the altering image and the spectator’s motion, cf. previously mentioned *vection* (LaValle, 2017, p. 57). If we disregard the virtual camera’s inherited motion from being constrained to a moving vehicle, *Pearl* do not have any camera movement except those caused by the spectator.

Without the intervention of a photographer’s prerecorded action this might lead to what Calleja calls *kinesthetic involvement* (Calleja, 2011, p. 43). This type of involvement comprises learning and internalizing controllers, i.e. a motor interface, which again returns feedback to the spectator via a sensorial interface. In *Pearl*, this is executed by mapping the reposition and orientation of the entire virtual environment to the spectator’s real-world movements. The interaction with VR films like this, is of course limited to gaze direction and repositioning within the room scale but nevertheless leaves the spectator with a sense of moving around

inside the diegesis, aided by a natural interface (her body). While shaky cam in cinema replays other people's motion, six degrees of freedom is mapping the field of view to the spectator's self-motion, which might be perceived less alienating and disempowering than if someone moves the field of view for you. Therefore, it is likely to assume that the agency to involve kinesthetically increases the sense of presence, though it might weaken the discursive conducting of a narrative, since the spectator's gaze cannot be predefined and thus constrained to a specific field of view.

CINEMATOGRAPHY: THE PHOTOGRAPHIC IMAGE

Invasion! has an exaggerated cartoony style of design when it comes to the shapes and proportions of existents, but the surface materials and textures are nevertheless semi-realistic. Pearl on the other hand, utilizes a more flat and painterly style of rendering. In CG, the term *non-photorealistic rendering (NPR)* includes several ways of lighting and rendering 3D objects that do not mimic photographic capture of materials and surfaces. A movie like *Cars* (Anderson & Lasseter, 2006) do have non-realistic characters, e.g. vehicles with facial expressions and other human-like qualities and thus remediates the creative anthropomorphism of old cartoons drawn on celluloids. But the film's overall "coat of paint" does not resemble hand-drawn art but rather imitates real world materials; Lightning McQueen's car paint is glossy and metallic, with lifelike reflections of its realistic surroundings. The rendering of a movie like this is therefore remediating photography. Contrarily, NPR remediates other techniques of representing visuals instead, like traditional *cel animation*. This is done with the use of algorithmic simulations, sometimes with supplementary manual labour (Bolter & Grusin, 1999, p. 139-142; Bordwell & Thompson, 2013, p. 387; Herring & McGraw, 2016; Spindler., Röber, Döhring, & Masuch, 2006).

In Pearl, every material, from skin tones and cloth texture to metal or grass, is rendered with flat colors, ignoring gradients, shadows, emboss and other details a photographic representation would provide to the surfaces. Thus, the graphics evokes associations with comic books or even watercolor painting.

But stylized and simplified aesthetics is not unique to VR. Pearl's director Patrick Osborne is credited as animator on Disney's Paperman (Internet Movie Database, c.), a well-known and artistically pleasing example of a CG-animated short for cinematic screening utilizing NPR. So, could this have a different effect when experienced in VR?



Figure 17: Still from Pearl (Google Spotlight Stories, 2016).

The virtual reality of Pearl is not a reproduction of how we perceive our surroundings in real life, cf. Fuchs et al.'s previously discussed mode of virtual reality as *simulation of the real world*. The spectator is rather stepping into a cartoon, or a painted reality, i.e. what Fuchs et al. (2011) denotes a *symbolic virtual reality*. The NPR in Pearl make the action appear as living illustrations, which again, despite iconic likeness, are symbols signifying real world existents. But if the spectator actually feel they are part of a cartoon, we might also regard Pearl as a *complete imagined world* (Fuchs et al., 2011). The latter would constitute a sense of spatial presence into a world of mixed media, like those represented in *Who Framed Roger Rabbit?* (Marshall, Watts & Zemeckis, 1988) or *Alice's Wonderland* (Disney, 1923). However, I believe the spectator will not perceive it this way for two reasons. First, the HMD will replace the spectator's total field of view, which again will occlude real life, including herself. Perceptually then, there will not be any mixed styles, only the style of Pearl. In the absence of a basis for comparison, this might lead the spectator to accept the NPR of Pearl as reality, of course aided by the spectator's own make-belief.

Second, Pearl tells a narrative based on memories. Even though we often use terms like "photographic memory", our memories are not captured light projected as images on photo film. As W. J. T. Mitchell (1987, p. 13) argues, mental images are not constant or palpable, and are presumably different from person to person. How we experience our own memories are strictly subjective, and the history of art has fostered countless configurations of shape and color attempting to depict mental imagery. For example, the impressionists sought to reject an "objective" reproduction of commonly available real-life motifs in favor of mimic the

individual observer's immediate perception of color, light and mood. This led to a simplification of details, partly influenced by the flat shading of Japanese woodblock prints (Brodskaia, 2012; Grau, 2003, p. 141-143). The flat colored, almost sketchy renderings in Pearl, bears strong resemblances to both impressionism and "le japonisme". By this comparison, I argue that the low fidelity in Pearl, understood here as photorealism, do not necessarily impair the sense of immersion. It might rather propel the spectator's cognitive effort towards fulfilling the experience. According to Bordwell, narration is a construct emerging from the spectator's own inferential processes, and one crucial ingredient is personal experience and prejudices (Bordwell, 1985, p. 31, 34). The rough and sparsely detailed renderings might be more open for individual imposition than highly detailed, and by this determined and locked, visuals, leaving the spectator with more gaps to be filled. Following Bordwell (1985, p. 55) this might allow a "more open-ended inferential work", meaning allowing the spectator to project her individual conceptions onto the characters and events, which might strengthen the sense of reliving the events retrospectively together with the protagonist.

CINEMATOGRAPHY: FRAMING AND CAMERA POSITION

A remarkable characteristic of Pearl is the continual presence and dominance of the car; no matter where the spectator turns her head the interior is always visible within the field of view. (An exception is if the spectator lifts her head out of the car's windows or sunroof). But though the interior takes up much of the space, it does not attract attention to itself. The sculptor Richard Serra utilized a similar camera-subject relation in his 1976 movie *Railroad turnabridge* (Bordwell & Thompson, 2001, p. 130). The difference from Pearl is that in Serra's movie the camera is anchored to a bridge, inheriting both locomotion and orientation. By this, the structure of the bridge is fixed within the frame while the surroundings are moving. The static and symmetrically balanced appearance of the bridge's structure makes it the centerpiece, drawing attention to its architectural qualities on behalf of the scenery. In Pearl however, only the initial positional relation between the vehicle and camera is fixed while the spectator herself can orient the virtual camera freely by her head and body movements. This curbs the attention to the vehicle, making it appear more as an inventory to be present within.

As previously discussed, the car is occupying much of the discourse space of Pearl. The total story space includes several locations, but the outside of the chassis is for the most part only implied. Besides functioning as the setting, the perpetual appearance of the car also creates a visual boundary between the explicit and the implied story space. In cinema, the perception of

space is largely related to framing, a feature that in VR movies usually is left to the spectator. Thus, some of the narrative affordances derived from predefined framing is no longer applicable in the same way. One of them is the utilization of *open* and *closed framing*, which regards how a framed composition signifies an extended narrative space. *Closed framing* offers no visual cues to the world outside the four boundaries of the image. In this case, all our attention is led to what is represented inside the frame. *Open framing*, on the other hand, provides indications of a world continuing outside the frame. We understand that what we actually see within the rectangle is not a complete world – there is more to this world outside the frame (Nitsche, 2008, p. 81). The cues indicating a continuous world beyond the frame can be motion, e.g. a character entering or leaving the frame, elements of composition, e.g. a cropped character indicates there exists more of the character we do not at the moment see, and any other visual information. It could of course also be provided by aural information, like an offscreen sound.

This technique is often used to establish a sense of realism, in the way that we feel like we are thrown into the action, and that the action does not wait or trying to present itself to us. In movies like *Boogie nights* (Anderson, 1997) and *Kids* (Woods & Clark, 1995) open framing is used for authenticity and to give the audience a feeling of “being there”. By its nature, VR and 360-degrees movies do not have any predefined framing. But Pearl shows that analogues to open framing can be applied in VR as well. In Pearl, this is done by using the ever-present car chassis as a visual boundary to the rest of the surroundings. By this, our glimpse of the distant surroundings from inside the car act as pointers to a continuous world beyond what actually reaches our eyes. The same goes for e.g. characters standing outside the car with their heads cropped, not to forget all the characters coming in and out of frame (or more correctly in the case of a 360-degrees view; our *field of view*) during the movie. The perception of an extensive space adds a sense of realism to the scenes.

So, why is it important to adapt the effect of open framing to VR? One might assume that putting the spectator into the diegesis would be sufficient for accepting it as real, and thus in itself constitute the same sense of “being there” as with the cinematic techniques used in e.g. *Boogie nights*? This would however rely too heavily on presence as a psychological state automatically achieved by using the right technology. This is already depreciated as what Salen & Zimmerman called the *immersive fallacy* (Calleja, 2011, p. 26; Salen & Zimmerman, 2004, p. 450). Being submerged into a mediated reality is deficient for accepting presence, no matter how perceptually convincing it would be. Presence, as well as immersion, would also

require what I in chapter 5 called *make-belief*, an attempt to merge terms like *suspension of disbelief*, *the magic circle* and *active creation of disbelief*. Calleja refers to Ryan (2001) who states that immersion relies on an “expanse to be immersed in” (Calleja, 2011, p. 28; Ryan, 2015, p. 69). This obligates either an open-ended world to roam, or the perceived idea that there is one. Our awareness of the world outside the car, in which we do not have fully access, can provide more realism, and increase the sense of being an attendant over just a distant observer. To achieve this, Pearl is creating its own constraints in the lack of the delimiting frame boundaries of cinema.

7.4.3 Editing

As mentioned, most of Pearl’s narrative is a series of *flashbacks*. This retrospective part contains several short scenes linked together with music, almost like a *montage sequence*. In cinema, a montage sequence usually has the purpose of compressing the *discourse duration* (Bordwell, Staiger & Thompson, 1985, p. 29). In the case of Pearl, we are presented with an outline of the protagonist’s biography from preschool-age to young adult. Though it is a matter of many years, it is all compressed to around four minutes and twenty seconds. The sequence serves as a *summary* (Genette, 1980, p. 94-95), and give the filmmakers the ability to significantly advance the story time without increasing discourse time. Laderman argues that montage sequences in road movies not always strive to convey narrative continuity but rather tends to exalt high-speed driving as an act of aesthetics, autonomous and not reliant on any outer purpose, like reaching a specific destination (Laderman, 2002, p. 16). Thus, travelling shots assembled together to a montage, might in many movies merely celebrate the act of being on the move; the interaction between the vehicle and the road is the actual motif, not any goal or narrative.

Compared to *Invasion!* Pearl offers far more visual information as a result of the frequent cutting. Pearl has almost forty different shots which gives an average shot duration of about 15 seconds. This is not much higher than the mean of multiple character-shots in cinema (Cutting & Candan, 2015). One reason the makers of Pearl can allow themselves increased pacing could be that the film is more depicting a certain mood than conveying a causal course of action. Therefore, it might not rely that much on key events for comprehension. Another reason could be that the whole movie takes place inside an old car, which causes large amounts of the picture to be similar, frame by frame and shot by shot. Less visual variation can seem to allow increased travel back and forth in time without wearing out the audience in a 360-degrees view.

To get a sense of how much of the visuals actually changes for each cut I selected a random frame of the movie seen from the default point of view offered by the Youtube-version of the film (Google Spotlight Stories, 2016). By extracting the fixed elements (car interior) from variable elements (characters, props and surrounding set) the histogram-tool in Adobe Photoshop gave me an approximation of 60 percent static visual information, not considering changes in light and color.

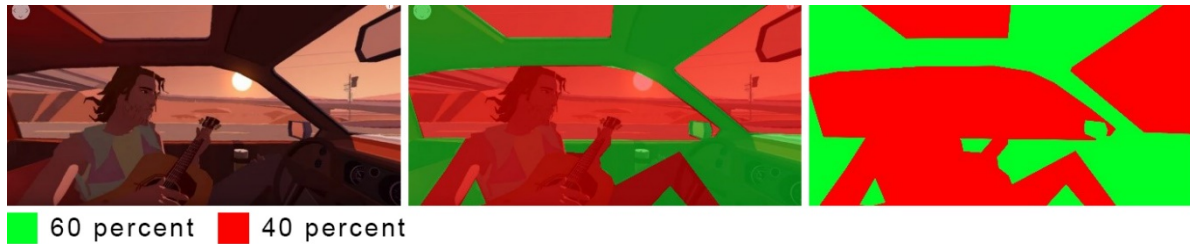


Figure 18: Static versus variable visual information in Pearl. Illustration by author based on still from Pearl (Google Spotlight Stories, 2016).

Though, this of course is not an accurate and scientifically reliable measurement, it nevertheless illustrates that large amounts of the visual information stays unchanged for each cut, leaving less new information to be absorbed by the spectator. Therefore, I argue that for Pearl, the combination of being assembled as a narrative summary and having a large amount of static visual information, allows for a more extensive cutting than other VR movies.

7.4.4 Sound

As Bordwell, Staiger & Thompson (1985, p. 29) highlight, one of the main conditions for a comprehensive montage sequence is *continuity*, and one of the strongest tools for linking scenes together is music. A musical score can act as a common element wrapping diverse parts together. Usually extradiegetic music is used because it does not have any direct or causal connection to the visuals. In Pearl however, the music exists in the borderline between diegesis and non-diegesis. In the film's second scene (the first of the retrospective part), the father is starting the tape recorder and begins to play. Here, the music has its source from within the fictional world and is thus diegetic. But in the following shots, the music still continues without having this connection (the father is no longer playing, at least not in sync with the score). Here the music turns over to be extradiegetic. In shots following later, the music is again occasionally switched back to be part of the diegesis when Pearl and her father are entertaining people passing by. This is comprehended by a difference in the sound mixing, e.g. outdoor reverb, and synchronization to the characters' action.

One might assume that the switching back and forth between diegetic and extradiegetic music in Pearl might interfere with the sense of being present and accept the diegesis as reality. Would not sound without sources within the virtual environment remind the spectator that there is a world outside and thus break the absorption? Not necessarily, since the spectator most likely will not perceive Pearl as a simulation of reality but rather as a *film*. In this regard, her schemata are set up to blend the scoring into the diegesis as a recurring musical motif (Bordwell & Thompson, 2013, p. 279; Salen & Zimmerman, 2004, p. 448-455).

The asynchronous relation between music and visuals can rather support the narration of Sarah's childhood memories. Usually we consider time as separate, discrete units successively replacing each other, but this is not necessarily how we *experience* time. A counter on a digital display will erase the previous number as soon as the next emerges, but humans on the other hand, do not forget the previous moment while entering the next. In fact, we are also often able to anticipate the subsequent. Ryan illustrates this by comparing the human perception of time with a "moving window that encompasses memories of the past and premonitions of the future" (Ryan, 2015, p. 104). Rather than experiencing the present tense separately with blinkers totally occluding both past and future, we experience the current moment as a stretch of time including both its predecessors and descendants. If this applies to reality, it should be transferable to how we experience time in virtual reality as well. Our windowed perception of time might allow for offsetting visual and auditory sensations, without compromising our cognitive engrossment. In the light of this, the extradiegetic scoring of Pearl does not necessarily break any presumed sense of immersion but can rather strengthen the spectator's emotional immersion with the narrative, by adopting Sarah's reminiscent as her own.

7.5 Spatial presence in Pearl

Feeling present in a virtual environment requires a perception of being transported away from our real-world location. In VR, this is technically done by covering eyes and ears by HMD and headphones. But leaving reality is not enough - we also need to be taken *somewhere*; the perceived transportation needs a destination. The events of Pearl do not happen in a specific place, which could impair the sense of presence, e.g. the spectator would only perceive to be captured in a ceaseless non-spatial motion. This is avoided in Pearl by coupling the spectator to the fictional vehicle. The ever-present car chassis constitutes a socket justifying the spectator's sense of presence.

In *Pearl*, the travelling itself is one of the central goals for the characters. Laderman (2002, p. 13) claims that for road movies, the vehicle and the act of travelling function as the basis for the narrative. What is interesting with *Pearl* is the ceaseless presence of the vehicle. The spectator's point of view is anchored inside the car which leaves little information about what is going on outside. In return, it allows witnessing confidential moments between the characters that usually would not be shared with us if we were not there ourselves. Ryan (2015) argued that empathy could lead to *emotional immersion*. The spectator can project the fictional characters' feelings onto themselves, causing a strengthened identification and engagement. Since this requires the spectator to cross the threshold of *make-belief*, it can be achieved by nearly any kind of media. What experiencing a VR movie like *Pearl* is additionally providing is *encapsulation*, i.e. a visually and auditory omission of reality aided by an HMD, and, caused by the staging of *Pearl*, a forced proximity with the characters. This leads to a cued and undisturbed *intimacy*. Ruben (2018, p. 93-95) explains the difference between empathy and intimacy mainly based on perspective; empathy revolves around other people's emotions, while intimacy is more directed towards the spectator's own emotional register and the subjective sense of being close to the others. As for empathy, intimacy can be seen as a cognitive realization of the perceived situation as well but can be imposed on the spectator to a greater extent with VR technology. In *Pearl*, this is achieved by the perception of being placed inside a car. This offers the spectator a *double encapsulation*, both by the HMD, and diegetic by the car chassis. Combined with the sensation of existents as volumetric derived by 6DoF, this might enforce the feeling of intimacy with the characters.

But although the spectator perceptually inhabits the car, and can closely observe the events unfolding inside, she is never recognized by the characters. Though the *invisible observer* is common within cinema, the experience is different within VR. The ability to move around inside a diegesis offers a certain sense of being present. But when the spectator neither is visually represented, nor acknowledged by the diegesis, like the case of *Invasion!*, this can provoke a feeling of detachment. Galloway (2006, p. 47-49) describes how the use of subjective shots are used in *Being Malkovich* to estrange the spectator. As mentioned, the point of view in *Pearl* is third person, and do not resemble subjective shots in the way that it strives to optically imitate a fictional character's emotional or physiological condition (Galloway, 2006, p. 41). But it shares the same traits as the shots described by Galloway regarding nurturing a sense of presence combined with no linkage to any diegetic body. For VR, this phenomenon is very common, and referred to as *floating head* (Larsen, 2018). In *Pearl*, the

disembodiment could lead to a stronger connection to the car, as the only artefact with a fixed spatial relation to the spectator's vantage point. The chassis is in Pearl the prerequisite for a sense of presence and is enabling the spectator to witness the action taking place inside. Thus, the spectator experiences the story through the eyes of the vehicle, making it, not only a setting, but an *implied narrator* as well (Chatman, 1978, p. 146-151). Narration through the perspective of inanimate objects is not unique to VR and has already been utilized in both film and literature, e.g. H. C. Andersen's *The Fir Tree* (Andersen, 1977). But what is different in Pearl is that the vehicle is not a character; the spectator is following *Sarah's* story. Nevertheless, the car is the existent providing a sense of presence.

In this way the immersion and presence have more separated sources in Pearl, than in other VR movies, something that can be demonstrated by applying Ryan's ideas of immersion (Ryan, 2015, p. 98-103). Sarah's childhood memories can awake *emotional immersion* within the spectator, in the understanding that Sarah can be acknowledged by the spectator as a fellow human, more than merely a semantic device. This is achieved, among other things, by Pearl's previously discussed utilization of *lighting, photographic image* and *sound*. The *temporal immersion* is also evolving around Sarah, as the editing of discourse time is basically recounting her personal reminiscence. *Spatio-temporal immersion*, is on the other hand more split. The distance between Sarah and the spectator is reduced by the aspects mentioned above, but the inclusion of the spectator into the diegesis is mostly carried out by the car chassis.

The car is the only existent that have a fixed relation, spatially and temporally, to the spectator's vantage point, and is in this regard the premise for her sense of presence. In Pearl, the spectator does not follow any characters around to different locations. The spectator is at the mercy of the information she is presented within the car chassis. The narrative of Pearl has different diegetic levels, as the contemporary, grown-up Sarah's reminiscing serves as a frame story for the retrospective scenes (Engelstad, 2015, p. 193). Still, these scenes are not seen solely from her perspective, as in some of the shots she is not even present. In this way the car itself becomes both, narrator, like *The Fir-Tree* is in H.C. Andersen's short story, and the space for the spectator to inhabit.

8. Analysis of Piggy



Figure 19: Still from *Piggy* (Failes, 2018).

8.1 About the film

Piggy is another short that emanated from *Google Spotlight Stories*. It was released in Annecy June 2018 and is directed by Jan Pinkava and Mark Oftedal. Pinkava won an Oscar 1997 for the CG-classic *Geri's Game*, and Oftedal is credited as an animator on several Pixar blockbusters (Failes, 2018.06.14; Internet Movie Database, f, g, h; Zahed, 2018). *Piggy* distinguishes itself from many other VR movies with its ability to present the narrative differently for each screening, depending on where the spectator looks, and at what moment (Failes, 2018.06.14; Zahed, 2018). According to Google (n.d.), *Piggy* offers a “new level of interaction between character and audience”. And it *does* actually deviate slightly from the linear succession of events occurring within a fixed duration of time, as we are used to with films.

There have been several VR movies attempting to hand more influence over to the spectator, either by distributing events in relation to the spectator's gaze, or even implementing interactivity and narrative branching (Bucher, 2018, p. 105, 311; Palmer, 2017). These experiences blur the boundaries between cinema and videogames. By blending conventional animated comedy with user interaction, *Piggy* is another production exploring VR's ability to include the viewer, and in this way trying to expand the medium of film.

8.2 Synopsis

A diligent pig is out jogging, probably to lose weight. Apparently, he is not in a very good shape, and struggles with motivation as he gets more and more exhausted. But when he becomes aware of being watched by the spectator, he puts in a little more effort in order not to lose face. Suddenly, he passes a delicious cake placed on a small rounded coffee table. At first, he valiantly resists the temptation, but the thought of the cake becomes more and more distracting. The pig starts circling around the table, casting sidelong glances at the cake. At one point he almost loses control and is about to seize the cake. But when he notices that the spectator is still watching, he straightens up, pretending to stretch out after the workout. This repeats until he finally resigns to the temptation. Not any longer caring about being observed, he lifts the glass dome off the cake and gets ready to feast. But right before he turns around to grab the cake, a jogging female pig comes jogging by. She grabs the cake right before him and runs away. The film ends with our protagonist pig madly chasing the rude female pig into the horizon.

8.3 Film form in Piggy

The overall narrative in Piggy do not differ remarkably from traditional animated shorts. Once again following Vogler's framework, *The Call to Adventure* could be when the pig spots the cake. He repeatedly tries to restrain himself, which could be regarded as *Refusals of the Call*. He is *Crossing the Treshold* several times, i.e. uncovering the cake and almost grabs it. As the only character (until the female pig enters in the last few seconds), the pig obviously functions as the *Hero*, though of the tragic kind, with personal flaws he is not able to defeat (Vogler, 2007, p. 34-35). The pig is charming and funny, and his commitment is admirable, but unfortunately his desire for sweets is overshadowing his brave efforts. According to Vogler, characters expressing universal needs appears more human, and is a strong marker for audience identification (Vogler, 2007, p. 90, 92). The spectator has likely felt the same way as the pig from time to time, fighting to resist temptation. As discussed in chapter 5, this can strengthen the empathy with the character (Ryan, 2015, p. 18, 111-113). So far, the narrative patterns of Piggy are approximately the same as in a traditional animated short. But there is one major difference when it comes to character functions. The pig is undoubtedly the protagonist, but the antagonist is not a character represented within the diegesis - it might actually be the *spectator*.

Most films have a dark force opposing the protagonist's objectives and goals, and very often it is represented by one or more characters. Propp describes *the villain* as someone who causes "some form of misfortune, damage, or harm" (Propp, 1968, p. 27). Of course, any spectator of *Piggy*, most likely, cannot be compared with Darth Vader or the witch in *Snow White*, but she nevertheless causes some "misfortune" for the pig. According to Vogler, *The Shadow* do not need to be a hostile enemy or villain, but could just have conflicting prospects (Vogler, 2007, p. 65). To explain what could cause this conflict in *Piggy*, I will rely on a common conception that animated characters can have the power to captivate its audience. In the world of animation, Thomas & Johnston's twelve principles of animation have almost become standardized guidelines for creating and evaluating animation. Some of the principles are technically describing laws of physics, while others are related to character behavior and personality. The twelfth principle, *appeal*, is a broad term covering every aspect of the character able to attract the audience's attention in a "magnetizing" way, from visual appearance to character expression and movement (Thomas & Johnston, 1981, p. 68-69).

In *Piggy*, the pig's appearance can be found appealing by its delightful character design, entertaining behavior and charismatic expressions. The spectator is likely to feel sympathy for the poor pig, and at heart she probably wants him the best, but her fascination of watching him might be too strong to leave him alone with the cake. The spectator's desire to watch contests the pig's desire to have the cake, which implement the audience as an essential part of the underlying narrative pattern. So even though the narrative of *Piggy* largely follows canonical formats, the incorporation of the spectator represents a significant deviation.

8.4 Film style in *Piggy*

8.4.1 *Mise-en-scène*

MISE-EN-SCÈNE: LIGHTING AND SETTING

The setting in *Piggy* is simple. Except the protagonist pig, his rival female pig and the side table with the cake, there is no existents, just a pure, white background. This concentrates all attention towards character and action. Simultaneously the blank background makes it hard to orientate, as the spectator is deprived of any reference points. MacLean (2011, p. 189) emphasize the importance of providing cinema audience with spatial clues, to help them get a sense of the geographical mapping of the scene. To be able to picturize the scenery in their minds, like relative positions, size, space and so on, increases the audience's comprehension

and engagement. In *Piggy*, these considerations have not been taken into account. When the protagonist suddenly runs out of field of view, all there is left is a white blank. And when the spectator turns around, she will consequently get no visual feedback of how many degrees she has spun, as long as neither the pig nor the cake is within field of view.

Ryan (2015, p. 247-248) divides her idea of spatial immersion into two subcategories, *strategic* and *emotional*. For some interactive media, like certain kinds of video games, the user takes advantage of space strategically to e.g. navigate or act in a beneficial way. The deserted setting of *Piggy* impedes this to happen. Alternatively, space can also constitute an *emotional* connection with a specific location, which involves a sense of actually inhabiting the represented scenery. This might happen in *Piggy*, but since the scenery is depleted for existents, it will presumably cause a sense of confusion. At the same time, it builds up under the premises of the film, which is the dynamic between the protagonist and the spectator. In the playful power struggle between the two, the pure white scenery gives the pig a head start in the game of hide-and-seek.

MISE-EN-SCÈNE: COSTUME AND MAKEUP

The protagonist is wearing a track suit and a headband, and when the spectator first sees him, he is busy jogging. The character design joins the same tradition as *Invasion!* with streamlined silhouettes constructed out of simple geometrical shapes. As mentioned in 8.3. the pig has appealing qualities, much because of how it is designed with a rounded body shape, convenient for adding dynamic squash and stretch. When used in VR, the world of *Piggy* is thus not what Fuchs et al. (2011, p. 6-7) denotes a simulation of the real world, but still represents something familiar, as our culture during the last century has been habituated to this kind of visual style and character design. For a new medium like VR movies, this might have an accommodating effect on the spectator by “granting access to the older media” (Bolter & Grusin, 1999, p. 45).

MISE-EN-SCÈNE: STAGING

While staging in *Invasion!* was firmly anticipated and slowly paced to make sure the spectator did not miss crucial action, the character in *Piggy* is intentionally trying to distract and lure the spectator. The result is a play of hide-and-seek, where the spectator is encouraged to turn around and look for the character trying to escape her gaze.

Juul uses the term “Half-Real” to describe the nature of videogames. By this, he means that even though the world represented in a videogame is fictional, the rules, outcome and the player’s interaction, and reactions, are real (Juul, 2005, p. 1-3). Though it is not a game with

rules and outcome, I argue that this partly applies to *Piggy* as well, at least when it comes to interaction and reaction. The spectator's objection is most likely to watch the pig since he is appealing and there is not much else to see. But the pig is trying to avoid being watched as he most preferably wants to stop exercising and just eat the cake. Piggy is equipped with a set of pre-authored actions, where specific actions can be prompted by the spectator's gaze. Though it sometimes has been stated that Piggy has a branching narrative (The Ghost Howls, 2018), I have only experienced one type of ending in all my see-throughs. This is confirmed by director Pinkava in an interview with Dessignare (2018), who tells that the beginning and ending are always the same, only the events between are changing. Following Juul's idea, this leaves the outcome remaining in the world of fiction. But the spectator's behavior is nevertheless real, and it influences the timing and order of events. In addition, when the protagonist looks back at the spectator, his pupils are constrained to aim at the virtual camera's position. This makes the eyes following the spectator, if she moves (Failes, 2018.06.14). Applying Juul's concept of videogames onto another medium might seem bold, so I will sum up what I mean like this; In the real-world there exists no jogging pig dressed in a track suit longing for cake, but in the fictional world of the VR movie, Piggy, it does. But what *is* true is that the spectator can influence how the fictional pig acts, and thus change both the content and duration of this VR movie (Juul, 2005, p. 163-168). Consequently, fiction and reality blends together; activities in the real-world intervenes the diegesis, and vice versa.

Compared with other VR movies, like Pearl and Invasion!, the convergence of fiction and reality in Piggy can provide a stronger sense of participation. According to Murray (1997/2017, p.159), *agency* can be described as "the satisfying power to take meaningful action and see the results of our decisions and choices". She distinguished the term from mere *activity* (Murray, 1997/2017, p. 161-162). Even though a 360-degrees video is interactive in the way the spectator can choose herself where to look, this do not equal *agency* in Murray's understanding. It will probably change *how* the spectator *experiences* the movie, but will not affect the narrative itself, understood as a chain of causally linked events (Bordwell & Thompson, 2013, p. 73).

The cake spawns around 45 seconds into the movie. If the spectator has fixed her eyes at the cake for too long, the pig is trying to lure her to turn away. He does this by repeatedly showing up in the edges of the field of view, waving and making faces to entice the spectator to follow him with her gaze. And if the spectator is trying to constantly follow the pig with her eyes, he might suddenly take a quick detour, hoping to shake off the stalker.

Piggy's *order*, *duration* and *frequency* will presumably never be identical for two different screenings. For the mid part, slightly varying but about half of the total duration, the staging of actions is to an extent influenced by the spectator. Still, the outcome, i.e. the ending, will always stay the same. This is possible because each event can have more or less importance in relation to the overall narrative (Chatman, 1978, p. 53). Chatman uses the terms *kernel* and *satellite* to distinguish narrative events based on their hierarchical status. Events crucial for the narrative progression, is called *kernels*. These are the key events influencing in which direction the story course will turn. Engelstad (2015, p. 52) uses the fairytale of *Little Red Riding Hood* as an example; if one of the kernels was removed, e.g. the spectator did not get to know that the wolf hurried up to the grandmother's house to eat her, the following events of the story would not be comprehensible. The same applies in Piggy; if the spectator missed the protagonist's greedy glance at the cake in the beginning, she might not understand his effort to direct her attention. It would, in Chatman's words, disturb "the logic of the plot" (Chatman, 1978, p. 54).

But a narrative consisting of only kernels, i.e. events that efficiently drives the story causally forward, is likely to appear, according to Engelstad (2015, p. 53, own translation), "compressed and monotone". That is why most films additionally are filled with events slightly deviating from the causal advancement. At one moment in Piggy, the protagonist removes the glass dome off the cake to have a bite. When he senses being watched, he pretends instead cleaning the dome by rubbing it gently. This event could be removed without disturbing the causal progression but nevertheless has a function of elaborating the protagonist's inner struggle regarding self-discipline and vanity. This little gag can be recognized as a *satellite*; the event is not decisive for story comprehension but is still orbiting around the kernel, by giving more depth to the pig's personality and intensify the comical situation. The figure below illustrates the relation between kernels and satellites.

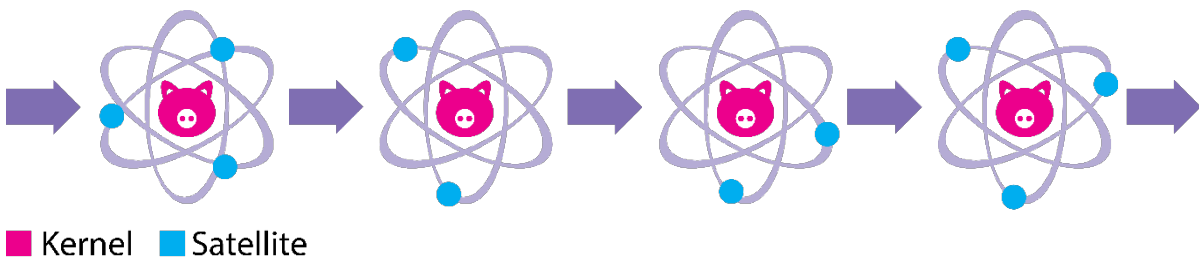


Figure 20: Illustration by author, inspired by Chatman (1978, p. 54) and Engelstad (2015, p. 52).

In Piggy, all the events are pre-authored but the emergence of some of the satellites is based on the spectator's field of view. This do not alter the narrative in any notable way since the

kernels, especially in the beginning and end, are unchanged. But the fact that parts of the staging is determined by the spectator might increase the engagement in the story.

8.4.2 Cinematography

CINEMATOGRAPHY: CAMERA MOVEMENT

Many of the actions and happenings in Piggy are laid out to encourage the spectator's interaction. This is largely achieved by utilizing space. When the pig wants to escape the spectator's gaze, he might suddenly turn around and spurt in another direction. Caused by this, the spectator most likely will lose sight of him for a little while, turning her head from side to side to catch up with him again. As previously discussed, the vacant surrounding space makes it hard to orientate, and it is easy to get lost. By this, watching Piggy demands an extra physical and perceptual effort, compared with other VR movies, like *Invasion!* and *Pearl*.

On Youtube, there are a couple of videos showing people watching Piggy (Nathie, 2018; The VR Couple, 2018), and it is remarkable how much they have to physically move to catch up with the action. This understates my previous arguments on how Piggy is blurring the magic circle, with a mutual influence back and forth between the narration and the spectator's behavior. According to Bolter & Grusin, media is real, not only because of its materiality but by being carriers and transmitters of culture, communication and economy (Bolter & Grusin, 1999, p. 58-59). They additionally note that even the act of mediation can affect human behavior, illustrating it with the example of how people avoid walking between a photographer and her target, just like this space contained a physical barrier. These repercussions occur with VR as well, which is evidenced by observing users. First, some 6DoF headsets requires cables connected to a computer and external base stations, emanating actual physical obstructions. But being around someone wearing a headset, do also constitute an awareness and respect for the virtual environment surrounding the user, even if she is the only one able to actually see it. And there is even a certain extent of cautiousness among bystanders as the VR-user is likely to perform sudden unpredictable movements while reacting to the mediated content.

All the camera movements in Piggy is deriving from the spectator's motion, caused by its 360-degrees view. In this VR movie, the staging of action is choreographed in a way that enforces the spectator to extensively turn around in the real-world to follow the virtual environment. The relation between the staging of action and the spectator's movements contributes to making Piggy "half-real", leading to affects exceeding the fictional world.

CINEMATOGRAPHY: FRAMING AND CAMERA POSITION

As for many VR movies, the camera is constantly positioned in one place but can be altered by the spectator's movements. The framing thus equals the spectator's field of view at any time. VR movies, like Piggy, remediates the medium of film, which again incorporates aspects of other types of media. Early in the eighteenth century it was common to speak of cinema as "photoplay" (Bordwell, 1985, p. 9; Bordwell, Staiger & Thompson, 1985, p. 99) a portmanteau indicating a consciousness around the heritage from photography and theatre.

This legacy is still evident in movies for VR. Piggy's director Pinkava once stated that virtual reality storytelling lies somewhere between filmmaking and theater (Dessignare, 2018). Being surrounded by characters acting and happenings unfolding, can give the sense of witnessing a live performance when inside the HMD, what Pinkava humorously called "canned theatre". In his book "Storytelling for Virtual Reality", Bucher (2018) several times draws the line between virtual reality and immersive theatre. *Immersive theatre* includes forms of performances that exceeds the traditional theatre stage, e.g. by using alternative locations and architectural arrangements, and even involving the audience as part of the performance (Bucher, 2018, p. 80-83; White, 2012).

Giving the spectator the perception of being transported into the fictional world, is simulating embedding her into a theatrical stage, as she is placed in the middle of the actors, props and other existents. Bucher (2018, p. 88) recites an interview with podcaster Noah Nelson who argues for the arrangement of *space* as the most important connection between immersive theatre and VR. In immersive theatre, the spatial distance and relation between the spectator and the existents are often unorthodox in the way it departs from the conventional boundaries where all the actors and props are placed within the rectangle of the stage floor, cut off from the audience in the auditorium. Contrary, VR-experiences are able to give the spectator a sense of being placed in the middle of the *Mise-en-scène*.

In Piggy, the character performance is spatially distributed around the spectator in 360-degrees, which forces the spectator to physically turn around to chase the pig. This diverges from witnessing a traditional theatre performance, or a movie for that sake, where all the action is gathered in one single field of view in relation to the spectator's real-world position. But it *does* bear resemblances to *immersive theatre* by using an expansive spatial area, i.e. exceeding a delimited stage floor, and mobilizing the spectator, i.e. enforcing her to turn around to keep up with the pig (White, 2012). The resemblance does however precondition a sense of

presence for the spectator to perceive the mediation as a live performance. This is likely to be achieved with the combination of encapsulation and the spectator's own effort of make-belief. Furthermore, may the perception of being recognized by the fictional character, and even, apparently, influence his behavior, strengthen the sense of observing a live performance even more.

Perceptually, *Piggy* is a film. When watched, the spectator is looking at framed compositions that changes over time. But the way the action is arranged, and spatially distributed in relation to the field of view, is largely akin to the experience of a live performance like immersive theatre. By this, cinematographic features like framing and camera position are dominantly entrusted to the spectator and her real-world movements, at the expense of supporting any predefined narrative discourse.

8.4.3 Editing

Piggy is a single-take movie, completely without editing. A montage of different shots is largely concerned choosing what to show, for how long, and what to leave out (Bordwell, 1985, p. 238). For example, elliptical editing is commonly used to shorten *discourse duration* when a character moves from one place to another. With the right stylistic utilization, the act of transportation can, on many occasions, be coherent without showing the total *story duration* (Bordwell & Thompson, 2013, p. 231). In the first part of *Piggy*, the protagonist is emerging from the white horizon jogging towards the spectator in a slow speed. Presented within a single take, the spectator beholds the total stretch of transportation as the pig is getting closer to her field of view.

An event like this could be fully comprehensible by cutting out the middle, e.g. with a dissolve, a common technique communicating that time has passed. Narration within montage is largely based on the spectator filling in the gaps, which makes it unnecessary to display everything descriptively (Bordwell, 1985, p. 243-249; Bordwell & Thompson, 2013, p. 231). Without editing, *Piggy* is not utilizing these kinds of stylistic tools.

But despite being a single-take movie, *Piggy* do in fact have a deviation between *story time* and *discourse time*. As mentioned in chapter 4, Chatman (1978) notes that this is related to differences in *order*, *duration* and *frequency*. A video published by Dessignare (2018) shows an Ancey poster announcing *Piggy* with the duration of three minutes and thirty seconds. But, in fact, this varies a lot for each screening. Just with my own see-through's I have

registered a duration of everything between ca. 03:20 to well over 03:40. Thus, a length variation of nearly half a minute, depending on the spectator's own activity.

Even if it is not predefined by discourse, we can regard the distribution of kernels in Piggy as a kind of spectator-driven editing. Though it is not editing per se, understood as cutting between different temporal and/or spatial configurations, it is cutting between another kind of pre-authored material, namely animated actions and happenings. Regarding narration, this means that the spectator is able to influence an aspect of *film style*, which invokes an inevitable adjustment to Bordwell's model described in chapter 4:

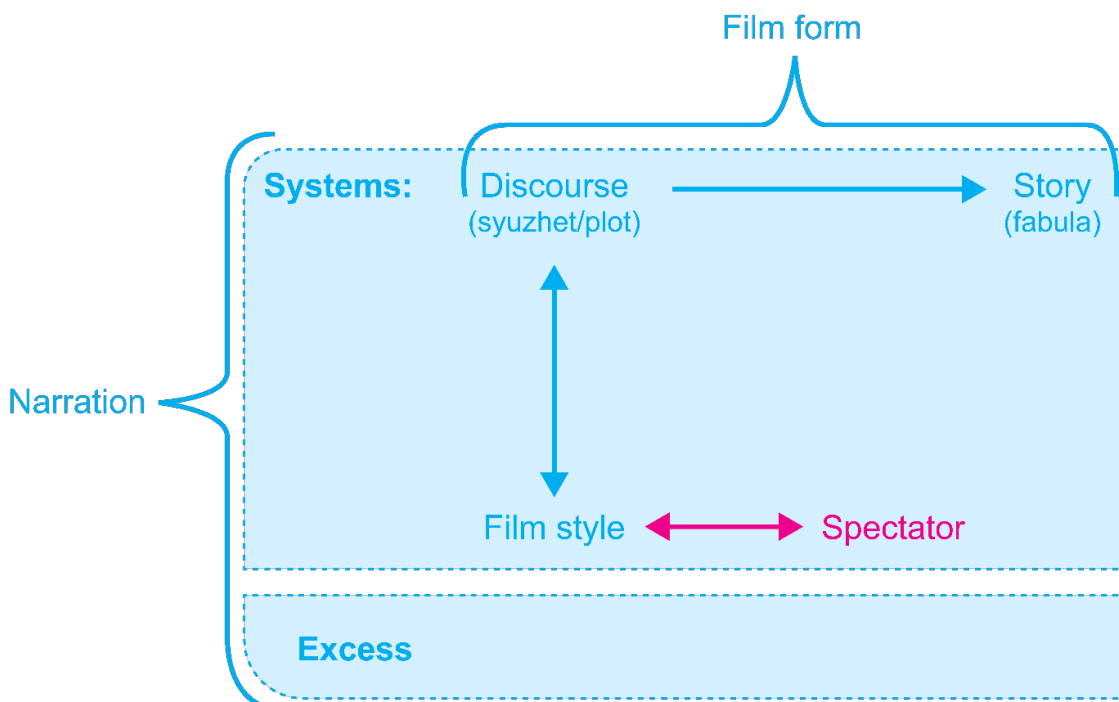


Figure 21: Illustration by author, based on Bordwell (1985, p. 50).

In the figure above, another “system” is added; *the spectator*. Piggy's user agency allows for a mutual influence between *film style* and *the spectator*, which further entails that the spectator can slightly alter the discourse, by interfering order, duration and frequency of kernels.

8.4.4 Sound

The soundtrack of Piggy is based on one of Schubert's vocal works. Its rhythmic qualities correspond well with the pig's bouncy run, and the German lyrics is altered to match the theme (Failes, 2018.06.14). Occasionally, the score is interrupted by pauses. The sudden silence is often timed to highlight a gag, e.g. when the pig suddenly quits jogging to do a quick reverse back to the cake. But the absence of music does also free up auditive space for sound effects, which in Piggy has a key role in relation to the experience.

As with the staging of action, the sound effects of Piggy are widely used with the intention to lure the spectator. Instead of the usual “synchronization of the senses” where sound supports the visuals for stronger comprehension, there are several occasions in Piggy where Foley sound is heard from directions without any visual source. For example, the pig’s hasty footsteps can be heard from the left of the spectator, but when she turns her head in that direction, no one is there.

Bordwell & Thompson (2013, p. 268) mentions *anticipation* as an important function of sound. When an audience hears something, e.g. footsteps, they expect the entrance of a character. In Piggy, the protagonist can be heard but many times without any accompanying visuals to assign the sound to.

Besides used ambiguously to contradict the spectator’s expectations, sound effects are also aimed at conducting the spectator’s attention away from the cake. Piggy utilizes spatial sound to cue and entice the spectator in favor of the pig’s intention to be alone with the cake. The sound effects are often unfaithful to what the spectator expects or perceives visually, and in this way amplifying her feeling of disorientation in the deserted virtual environment.

8.5 Spatial presence in Piggy

Putting on an HMD, is like vacating reality and surrender to whatever kind of world the specific VR-experience will offer. Of course, it is only a matter of sensation and perception, and the spectator is always to a degree aware of the mediation, cf. previously discussed *immersive fallacy* (Salen & Zimmerman, 2004, p. 450). Nevertheless, Piggy is transporting the spectator to a blank world with no geographical or spatial points of reference. This is beneficial for the protagonist pig who seeks to mislead the spectator with intent to be left alone with the cake.

The protagonist can be regarded as a tragic Hero who keeps failing no matter how much effort he invests. This can constitute *subjective reactions* to him within the spectator, like sympathy, or that she feels sorry for him. Since his most outstanding flaw is a universal one, namely the longing for sweets, it is also likely that the spectator might identify and relate to the same feeling, thus *empathize* with him. But there is a play going on between the pig and the spectator as well, where the former is trying to shake off the latter. This might also lead to *self-centered emotions*, e.g. that the spectator is getting confused, and even a bit annoyed over being fooled.

Clearly, the relation established between the protagonist and the spectator in Piggy pave the way for what Ryan (2015, p. 111-113) calls *emotional immersion*. In principle, this is achievable in other media as well, but it is likely to assume that the *self-centered emotions* might be stronger in the VR movie Piggy, than within e.g. a regular animated short, for two reasons.

First, being cut off from reality and transported into an empty and apparently immense space, might leave the spectator estranged. Even though she will be conscious about the mediation, it can constitute a certain degree of vulnerability. In addition, when the only character present is trying to bewilder her, this might cause self-centered emotions, like helplessness, that may not have occurred if the represented world did not cover her entire vision.

Second, the sense of *agency* deriving from the pig's seeming awareness of her gaze and consecutive behavior, might lead to a stronger involvement. Of course, cinema depends on involvement as well, at least cognitively if we follow Bordwell's view. But so-called interactive media additionally requires physical involvement via motor interfaces, which again is returned as feedback through sensorial interfaces. The feedback confirms the spectator's influence over the representation, e.g. causing the pig to put down the cake when caught red handed by the spectator. But as previously mentioned, the protagonist's antics combined with the lack of spatial reference points makes it hard for the spectator to orientate. The acquired agency in Piggy comes with a prize, as the protagonist is doing whatever he can to mislead and slip away. I previously compared Piggy with a game of hide-and-seek, and this may increase the spectator's self-centered emotions when it comes to the outcome. For example, *joy* if she catches up with the pig, or *frustration* if he disappears.

By this, it is likely that a VR movie with elements of interactivity can be a stronger source of self-centered emotions compared to e.g. traditional cinema. Of course, the latter can provide this as well, as mentioned in chapter 4, e.g. watching a horror movie can cause a feeling of fear as a subjective reaction to the mediated content. But I believe the spectator can access a wider range of personal reactions to the content when she gets a perception of being placed inside the diegesis, something that is accentuated by the agency to influence her surroundings.

But with extended agency, comes the question if Piggy is still a *movie*. Piggy let the spectator to an extent influence the narrative discourse's order, duration and frequency, giving the impression that the protagonist acts accordingly to her real-world behavior. This might

strengthen the cognitive absorption into the content, i.e. immersion, and the sense of being transported to and inhabiting the diegesis, i.e. presence. But does the agency simultaneously turn Piggy into a *game*, rather than a movie? We can take a look at two acknowledged game definitions. Salen & Zimmerman proposed this definition in their book “Rules of Play: Game Design Fundamentals”:

“A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome” (Salen & Zimmerman, 2004, p. 80).

The following year Juul suggested another definition in his book “Half-Real: Video Games between Real Rules and Fictional Worlds”, where he additionally takes the prospects of a variable outcome into account, as well as emphasizing the player’s emotional responses:

“A game is a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome, and the consequences of the activity are negotiable” (Juul, 2005, p. 36).

Trying to follow the protagonist in Piggy can bring associations to a game of *hide-and-seek* or *playing tag*. But to call the experience *rule-based* is a bit of a stretch, as there are not any defined set of rules, nor does the experience provide any feedback whether any rules are broken or not. There is however a “player effort” if we refer to the physical and perceptual endeavors needed to chase the pig. The spectator engages in an “artificial conflict”, namely the clashing desires of the spectator and the protagonist. But again, without being “defined by rules”, the engagement in Piggy do not fulfill the criteria, according to Salen & Zimmerman’s definition.

By “negotiable consequences”, Juul means that the game, or the act of playing, is capable of causing repercussions for the real-world. This is already discussed earlier in this chapter, and found likely to be the case of Piggy, considering increased *self-centered emotions*, as well as occupying real-world space by enforced physical activity, cued by the content. Though this regards the spectator’s interactions and reactions, it might however be on the outer edge of Juul’s idea, since he also includes *rules* as part of what makes a game “half-real” (Juul, 2005, p. 1).

Another aspect that counteracts with the game definitions, are the conditions around *outcome*. In Piggy, the fixed ending contradicts a *variable* outcome; watching the film always leaves the spectator with the same finale. One could argue that the spectator gets a variable outcome in relation to gaining a unique experience for every see-through, but this is not easy quantifiable, neither would it be an outcome “beyond discussion”, which Juul (2005, p. 39) emphasize as a prerequisite.

In Piggy, the spectator can influence the content, as well as connect with it emotionally. But there are several aspects, mainly concerning rules and outcome, that dismiss the game association. One of the features preventing Piggy from being a game, according to Juul’s definition, is the fixed outcome. But if we imagine Piggy *did* have a branching narrative, would it then be a game? According to Juul, probably not, because of Piggy’s pre-authored events. About the relation between games and narrative, he claims that “games are not *representations* of events, they *are* events” (Juul, 2005, p. 158). By this, just triggering predefined events and shuffle their order will not qualify. The events need to emerge out of the player’s activity.

Summarized, Piggy cannot be regarded as a game, but it nevertheless does mimic the medium at a certain level. Caillois (1958/2001) is known for distinguishing games into four categories, based on their primary characteristics. If we apply his concept onto Piggy, it is obvious that the film shares traits with many *types* of games. Though not conspicuous, there do exist elements of *Agon*, meaning “contest”. Piggy is based largely on the competition between the protagonist, trying to avoid being watched, and the spectator, trying to keep an eye on him. Caillois’ next category is *Alea*, meaning “chance”. Even though the algorithms are probably raised to act in specific ways, it nevertheless feels like the protagonist’s actions are randomly revealed. The other way around, it is indeed a matter of chance; the pig will never know where and when the spectator will look for each time. Caillois has a third category, *Mimicry*, meaning “imitation”. I have previously discussed how make-belief is obligatory for accepting a fiction world, either we look at immersion or presence. Caillois’ last category, *Ilinx*, meaning “vertigo”, is definitely present, caused by the already discussed *setting* and *staging of action*, assembled to bewilder (Caillois, 1958/2001, p. 14-26; Juul, 2005, p. 10). According to Caillois’ fundamental categories, Piggy undoubtedly has *game-like qualities*, even though it is still a movie.

The shared traits with both videogames and cinema clearly prove the *hypermediacy* of Piggy. Simultaneously, the spectator is cut off from reality and inserted into a “canned theatre”, which

might serve as an attempt to conjure a sense of *transparent immediacy*. Both mediation strategies work together concurrently and accepting Piggy as “non-mediated” requires former experience with the medium, as well as a cognitive activity by the spectator, what I previously called *make-belief*. Assumingly, the *agency* to influence the diegesis might lead the spectator to *see through* the mediation as well, making the content appear more “real”.

In chapter 5, I argued that increased *involvement* could strengthen the sense of immersion and presence. For *Invasion!* and *Pearl*, the user-influence was limited to the position and orientation of the field of view. In *Piggy* however, the spectator can alter the course of events, as well, at least to a certain degree. This might lead to an increased involvement but it also borders *Piggy* towards video games. According to Ryan (2015, p. 240), an interactive narrative can be structured around either a bottom-up, or top-down system. The *bottom-up* system basically involves providing a set of existents, and let the narrative be constructed emergently based on user-interaction. Contrary, the *top-down* narrative is a predefined succession of events, similarly to this thesis understanding of narrative, described in chapter 4. The latter can apply to games as well, since many games are arranged with one or more predefined destinations or outcomes (Ryan, 2015, p. 241). The journey there will be slightly different from each playthrough, depending on the flexibility of the game mechanics, but the finale will in many games be unaltered, e.g. the avatar overcomes the final boss at his hideout and saves the princess. The narrative structure of *Piggy* bears some resemblances to this, even though there are disparities. Even without branching, i.e. only one possible outcome, playing a video game structured around a top-down narrative, usually still leaves a chance of failing. This is not possible in *Piggy*; the ending will nonetheless be the same, independent of the spectator’s skills and effort.

So even with a certain degree of agency, the spectator of *Piggy* is still left with a relatively peripheral role regarding the narrative. The film allows for the emergence of both self-centered emotions, and other-centered emotions, like empathy with the pig, which might increase immersion with the content, but with only minor ability to influence it (Ryan, 2015, p. 251). The question is if *presence* and *narration* are mutual exclusive features, or of it is possible to arrange an experience utilizing both in a complete way.

9. Conclusion

When I initially encountered short films for VR and 360-degrees view, some of my first thoughts were the limitations of the medium. A 360-degrees field of view is overthrowing many of the stylistic features cinema has relied on to convey stories. Cinema's predefined framing and editing is able to turn the spectator into the *ideal observer*, an expression used to illustrate how the film seeks to arrange optimal camera-positions in relation to the preceding narrative (Bordwell, 1985, p. 9-10, 110-113; Bordwell, Staiger & Thompson, 1985, p. 37). For VR, predefined framing is gone, and editing is kept to a minimum for several reasons already discussed. That is why I was interested in looking at how *VR movies* utilize *film form* and *film style* in order to tell stories, and if the potential *sense of spatial presence* in any way can contribute or conflict with the narrative. With the absence of several cinematic features, is the VR movie still able to perform intricate narration? Or is the concept of narrative VR just a gimmick? Are filmmakers stretching and cutting the limbs of cinema just to shape it into a new platform of hardware, just like Procrustes did with his victims to fit the iron bed?

Of course, assumptions like these can seem valid. The narrative form of my study objects is faithfully following established canonical formats. Even though the spectator can be included, like an Ally in *Invasion!* or an antagonist with a certain degree of agency in *Piggy*, the chain of events can still be put together into the form of e.g. *The Hero's Journey* or the *Three Act Structure*. But, simultaneously, this applies to a large amount of narrative media, and cannot be unambiguously written off as attempts to force previous media into a new platform. Story structure is characterized by a comprehensive overlapping amongst diverse forms of expression, from folk tales and literature, to film, and videogames (Bordwell, 1985; Chatman, 1978; Genette, 1980; Juul, 2005; Murray, 1997/2017; Propp, 1968; Ryan, 2015). Campbell (2008, p. 220) argued for the human consciousness as the source of myths and archetypes which subsequently are converted and structured into narrative elements. The shared underlying structure of myths with significant geographically dispersed origins, got him to partly base his model on Jung's idea of the collective unconscious (Campbell, 2008, p. 12-14, 28, 220-221). Derived by this, there might be something fundamentally human by arranging the act of recounting events into stages that can coincide with e.g. the monomyth. So, maybe it is only natural that VR movies, created by humans for human receivers, follows a similar form.

But constructing equal types of storylines within a 360-degree view demands some adjustments. The absence of predefined framing causes the staging of existents and events to be more important for cuing the spectator's gaze. The staging in depth can as well be a more significant narrative device in this medium, helping the spectator to select what should call for her attention at any time. This can also in some cases compensate for the absence of predefined off-screen space, e.g. by occluding existents behind others and in this way elicit interest and curiosity among the spectators.

9.1 Findings

In general, without the discursive tools deriving from predefined framing, a VR movie needs to come up with workarounds to be able to cue and constrain the spectator. At first glance, this might appear like procrustean means to accommodate the technical features of a ubiquitous field of view. But my analyses have also revealed intimations of what Bolter & Grusin (1999, p. 49) calls "*authentic aesthetics*" for VR movies. The following sections will describe my main findings.

9.1.1 Inclusion

What largely characterizes the three study objects of this thesis is *inclusion of the spectator*. The role of the viewer should not be underestimated in traditional cinema either, but the technology of VR offers new ways of participation. Both *Invasion!* and *Piggy* acknowledge the diegetic presence of the spectator, including her as a character in the narrative. *Invasion!* additionally grants the spectator with an avatar, to confirm this presence. *Pearl*, on the other hand, is experienced through a third-perspective invisible observer, like common within cinema. The characters are not aware of the spectator, but *Pearl* nevertheless offers a sense of perceptual presence by being anchored to the old car and perceiving the discourse space as volumetric.

All three films share the ability to shift the vantage point within the diegesis, letting the spectator look around and observe the world from all angles. By this, parts of the film style are left to the spectator, which again will influence how she perceives and constructs the story. Film style and discourse works in a symbiosis of mutual influence. When the spectator is handling aspects of film style, she is consequentially included in the systems that facilitate story creation.

9.1.2 Exclusion

There is something compulsory over the way VR is experienced. Strapping on a headset breaks the ties to reality, at least the visual and auditive sensation of it. This implies that the spectator loses sight of herself as well. While VR *includes* the spectator, it simultaneously *excludes* her own real-world appearance. Sometimes she is provided with a substitute, like the avatar-body in *Invasion!*, but other times she is reduced to a disembodied vantage point, like in *Pearl*. The paradox is that even though the spectator's body is perceptually erased or replaced, it seems like the awareness of it is not weakened – rather the opposite. When the perceived visual information alters for every tiny bodily movement, this is likely to increase the awareness of oneself (Grau, 2004, p. 278). The encapsulation will also hide every other real-world reference, enabling a VR-experience to change how the spectator perceives herself in relation to the world. I discussed an example of this in *Invasion!* where the spectator can get the sense of being scaled down to the size of a little rabbit. The encasing of the spectator will naturally draw her total focus of vision and hearing to the mediated, unlike other media where surroundings can more easily distract. But what is just as important as unobstructed attention, is what this does with the subjective awareness of the spectator's own role, and how this affects the interpretation.

9.1.3 Accustomization

The exclusion of real-world references caused by the encapsulating HMD can accustom the spectator's senses to other types of realities. As described in the previous section, the sensation of a different world scale can lead to perceiving oneself e.g. shrunk or enlarged. Based on a study of Banakou, Groten & Slater (2013), I have suggested that this can cause a change in perception and behavior. Additionally, it is reasonable to assume that this again can affect *how* a spectator make inferences and hypothesizes in relation to story construction, but this needs to be confirmed by further research. Nevertheless, accustoming to an alternative reality can increase the emotional immersion, since the spectator practically is experiencing the narrative from the inside. In *Pearl*, she is not *told* that the lights are dim inside the old car but *senses* it herself. The exclusion of the spectator's real-world reference points accustoms her to another reality which makes it harder to distance herself from the diegesis and narrative (Grau, 2004, p. 152).

9.1.4 Volumization

To a greater extent than other narrative media, watching events unfolding through an HMD adds space and volume to the representation. First, 6DoF leads to an increased depth

perception, where the existents appear to have volume. Basically, this conceals the act of mediation. An oil painting can utilize monocular depth cues to give a sense of depth and volume, but this is soon revealed; anytime the viewer changes her position, the angles, distances and foreshortening in the motif will remain unchanged. In VR however, all of this will change for every tiny body movement. By this, the desire for depicting subjective perspectives represented by e.g. cubism, is fulfilled (Ryan, 2015, p. 14). This might expedite the acceptance of the existents as real, strengthening the spectator's make-belief in the diegesis.

The volumization also applies to the overall setting, which no longer is limited to a defined area, e.g. the silver screen or the theatre stage, but can embrace the spectator ubiquitously. Events unfolding in a perceived space rather than on a flat screen gives the spectator an increased sense of being included, not least because she must make physical effort herself to follow the action encircling her. This simulates how someone witnesses events in the physical world, like an embedded attendant, instead of a distant, third party spectator.

9.1.5 Narrative time

In a 360 degrees-view, it seems like time is a central obstacle for linear narration. The ability to alter the field of view combined with actions unfolding at predefined moments of time, increases the chance of missing out on events crucial for narrative comprehension. *Invasion!* bypassed this by no cutting and few and carefully anticipated key events. In *Pearl*, there is more cutting, and the *story time* is way more comprehensive. But despite this, by narrating the story through a montage sequence, *Pearl* depicts in broad strokes an overlying narrative progression rather than relying on single events. In addition to large amounts of visual information being kept unchanged from cut to cut, this makes constraining of the spectator's activity less decisive for the overall comprehension. In *Piggy*, the order, duration and frequency of satellites is altered relatively to the spectator's gaze. In this way, parts of the discourse time are influenced by the spectator, causing a more unconstrained temporal linearity, with less risk of missing out events crucial for narrative comprehension.

9.1.6 Continuity

Digital media has the ability to composite, rather than juxtapose, separate elements together. This enables blending diverse ingredients to a perceived wholeness, concealing the hypermediacy (Bolter & Grusin, 1999, p. 25, 27-28; Manovich, 2001, p. 142). This largely applies to my study objects; a common trait is that they all implicitly claim for their own

continuity. First, the spherical field of view totally occupies the spectator's vision. The images are not cropped by frame edges but continues without interruption in 360 degrees. Second, they attempt to merge the spectator and work together as one entity. The spectator does not distantly watch a representation but perceives to be part of it herself by being able to shift her field of view around the encircling imagery. In this way, she is also operating parts of film style, which is a system contributing to the narration. The line between the film and spectator is removed, which is why "breaking the fourth wall" do not necessarily have the effect of breaking the make-belief, but rather augment it. Being addressed by a virtual environment's existents can confirm your already established sense of spatial presence. This makes the reality of the spectator and the reality of the existents appear *continuous*.

Both *Invasion!* and *Piggy* are represented through a single take. Pearl, on the other hand, have many cuts, but only leading to temporal shifts within the same location. The relation between the spectator's field of view and the car interior remains fixed through the whole movie. As discussed in chapter 7, this makes cutting less intrusive since much of the visual information remains constant. At first glance this can be perceived as limitations with the medium. In VR, cinema's powerful tool of editing must be used sparingly in order not to cause discomfort or confusion within the spectator.

However, if we turn this around, we might rather look at many of the tools we regard as film style as feasible ways of defying the limitations of cinema as a medium. The fundamental premise for cinema is juxtaposition and montage (Bolter & Grusin, 1999, p. 75); fragmentation is really one of its main characteristics. Over time, we have learned to perceive the medium as natural even though the assembly of separate, independent images in succession, which many of the motives often do not have any relation in real life, is undeniable arbitrary. Some experimental works, like e.g. Chuck Jones' *Duck Amuck* (1953) which accentuate the techniques behind animation production on behalf of establishing diegesis, or works containing intertextuality and references to other works, like the Genie-character in Disney's *Aladdin* (1992), attracts the attention towards the mediation (Bolter & Grusin, 1999, p. 148; Bordwell & Thompson, 2013, p. 392-394). Except from examples like these, movies seek to be perceived as a whole; as *one* coherent diegesis. This is achieved by teaching the audience to look beyond the extreme hypermediacy of cinema and accept it rather as transparent immediacy. The 180° system were invented to maintain the audience's spatial comprehension, filmmakers cut on action to bind shots together and make the shift easy on the eyes and an actor's voice can be heard off-screen to assure us she is still there, even though we cannot turn

our head and see for ourselves. All these and many more are examples of ways to camouflage the act of mediation and affirm its wholeness.

In *Invasion!* the filmmakers did not need to pay attention to the 180° rule or shot/reverse-shot editing as the spectator actually is located amidst Chloe and the aliens, and thus is provided full spatial orientation by turning her head back and forth between them. Set in this perspective, narrative VR does not solely mean the loss of storytelling devices, but rather the disappearance of some of the obstacles its predecessor, *cinema*, bypasses in order to tell stories. Editing and framing have developed into powerful instruments but might also have originated as circumventions to pass beyond the limitations of representing a fictional reality through a rectangular image. The disappearance of frame boundaries make way for new experiences. As we have seen, breaking the fourth wall in VR do not necessary wake the spectator up from the diegesis but might as well psychologically submerge her even more. The desire for immersion and presence is nothing new but have been the objective for many filmmakers through the history of cinema. But until now, without the ability to actually place the audience onto the silver screen.

9.2 The road ahead

I have looked at many examples of how film style and film form has been used to tell stories in VR movies. As the medium appropriates and refashions the medium of cinema, there are of course similarities. But the new way of converging film and spectator also incurs changes in how narratives are constructed and perceived, already summarized in the sections above.

At the end of chapter 4, I referred to the occasional incoherence between the film's *narrational systems* and *excess*. As mentioned, one of the main characteristics of excess is, according to Thompson (1977), the lack of motivation. The same applies for VR movies with spectator-driven framing. If the spectator turns away from Chloe to enjoy the beautiful landscape, the framing is not motivated by the narrative. The sense of spatial presence is partly led from the agency to look around freely, but the same affordance can simultaneously interfere with the narrative. Equally, stylistic features broadly used to conduct the temporal and spatial discourse within cinema, can in some instances break the illusion of being inside the diegesis. Cutting between two shots *can* violate the sense of presence since the spectator is abruptly pulled out of the time and space she has accustomed to.

But even if there are signs of contentions between *narration* and *spatial presence*, my study has not revealed any clear, universal patterns. Whether they pull in opposite or coinciding directions relies heavily on the actual context. Narration and spatial presence are not parts of a dichotomy, where only one can be active at a time. I have also found examples where they work together, driven by the same motivation. For example, *Piggy* takes advantage of the spectator's chance of missing the protagonist out of sight and uses it as a premise for the plot.

In this study, I have mainly used Bordwell's understanding of film narration (Bordwell, 1985, p. 50). I still do not think this is wrong, but I am also aware that this enlightens the medium of VR movies only from one specific side. There are several other approaches I could have chosen, and I hope, and believe, VR movies will be investigated from other angles in the future.

With extended implication of natural interfaces and increased user agency, VR movies should be studied in relation to phenomenology and embodiment, like e.g. Sobchack has done with cinema. And since VR movies by its subjectivity can carry much "excess" which escapes narrative motivation, they should also be examined detached from the framework of cognitivism, which can be criticized for overly focus on pragmatic functions and causal logic. One potential angle could be the philosophy of Deleuze, which to a greater extent transcends the reliance on structuralism and schemata (Osland, 2012). Last, to achieve a deeper understanding of VR movies as a medium, it might be fruitful with a study based on Lars Elleström's model of modalities and modes (Elleström, 2010).

After *Invasion!*, Baobab Studios has experimented with more lengthy formats with their 22 minutes long *Crow: The Legend* (Failes, 2018.11.15), and releases their latest work *Bonfire* at the Tribeca Film Festival this spring. The latter comes with a promise of offering the spectator more agency over the narrative (Takahashi, 2019). Also, larger companies, like Disney, put a lot of resources into developing narrative VR further (Feltham, 2019). As mentioned in the introduction, VR movies till this date are, to a great extent, early experiments. Maybe in the future my selected study objects will have the same status as Lumier's *The Arrival of a Train at the La Ciotat Station* (Bolter & Grusin, 1999, p. 155) or Catmull's *A Computer Animated Hand* (Sito, 2013/2015, p. 64-66); dawning proof of concept and reference points for future productions. Future works within narrative VR will probably be even more multifaceted, which demands further assessments on the tension between narrative comprehension and the sense of spatial presence.

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