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THE GLUE OF NARRATIVES

-INDIRECT STORYTELLING IN A DIGITAL WORLD

Authorisation for writing the thesis in English

Fra: Tom Nyvang
Sendt: 13. januar 2016 15:56
Til: Lars Kiesbye Bendixen
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Emne: SV: Ansøgning om dispensation for at skrive speciale på Engelsk

Kære alle

Det er bevilget.

Mvh. Tom

Fra: Lars Kiesbye Bendixen
Sendt: 13. januar 2016 15:51
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Emne: Ansøgning om dispensation for at skrive speciale på Engelsk

Hej Tom,

Vi er 3 specialestuderende ved Interaktive Digitale Medier.
Vores speciale omhandler narrativer og specifikke mekaniker i computerspil, hvilket vi godt kunne tænke os at skrive på Engelsk. Vi skriver derfor til dig, for at søge om dispensation til dette. Vi har allerede snakket med vores vejleder Ole Ertløv Hansen om dette og han synes det var en god ide.

Her er nogle af vores grunde til at ville skrive specialet på Engelsk:

- Fagsproget inden for spil er hovedsageligt på Engelsk, hvilket vil gøre det mærkeligt at finde Danske ord for Engelske udtryk.
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Mvh,
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Specialestuderende ved Interaktive Digitale Medier

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Peter Skov Klitgaard Madsen

Resume

This thesis has been made by three Interactive Digital Media students with two different bachelor backgrounds. One who has a bachelor degree in IT with a focus on business and the other two with a bachelor degree in Medialogy. The thesis take roots in the Unified Theory made by Ralph and Monu (2015), which is a way to describe the interaction between the **Players**, the **Artifact** (the video game and delivery devices) and the **Experience** this interaction produces. The thesis aims to investigate four different research question:

1. *How do video games relay narratives and enjoyment, and in what way do different aspects of the video game experiences work in conjunction with one another?*
2. *Which narrative mechanics are used to indirectly emphasise video game narratives and are these indirect methods represented in video game models?*
3. *What can be used to indirectly emphasise video game narratives outside fields of study or content production?*
4. *How are non-fundamental elements of video game mechanics or narratives represented and functioning within video game design?*

In order to answer the research questions it uses, as mentioned, the Unified Theory by Ralph & Monu (2015) as a base. To ensure the validity of their theory, we compared some of their definitions to other authors on the subject of video games. As part of this process we found certain aspects were not accounted for in Ralph & Monu's (2015) theory, such as certain implicit narrative methods: Environmental Storytelling, Guidance, Form & Colour, Animation among others. In order to include these, we suggested **Emergent Mechanics** as a concept and its inclusion into the model. The definition is as follows:

> ***Emergent Mechanics:*** *Rationalised design choices made in order to promote certain desirable Emergent- and Interpreted Narratives in relations to Game Mechanics and Embedded Narratives.*

Many of the techniques that fit into the description of **Emergent Mechanics** were explored throughout the thesis. In addition, the Unified Theory (Ralph & Monu, 2015) and the suggested **Emergent Mechanics** were discussed through an online fora with people in and around the game industry. This was done in order to ensure the validity of **Emergent Mechanics** as a categorisation for the previously mentioned techniques. This discussion raised the issue of the chosen naming, as people with different backgrounds were inclined to suggest different names for the categorisation. The thesis concludes the definition is functional as a concept, but the naming may need re-evaluation.

Preface

This master's thesis is composed by Kenni Kirkegaard Hornstrup, Lars Kiesbye Bendixen and Peter Skov Klitgaard Madsen. A group of students studying Interactive Digital Media at Aalborg University. The project period were from 1st of January 2016 to 31st of May 2016.

Every member of the group is motivated by hopes of entering the video game industry after completion of the education. They were a part of the DADIU program before writing this thesis, but with different roles: Project Manager, Game Designer and Level Designer. The thesis itself revolves around video games and the use of implicit communication to affect player behaviour. The personal goal of the thesis was to acquire knowledge to better understand and create video games in the future.

Reading guide

We expect the reader to have some knowledge on the subject of video games, but we have included a glossary, explaining commonly used terms.

Ralph & Monu's (2015) suggested Unified Theory has been used as the lens of this thesis. We have written the words describing the central classes of their theory in **bold** throughout the thesis, these are **Players**, **Experience**, **Artifacts**, **Interpreted Narratives**, **Emergent Narratives**, **Dynamics**, **Aesthetics, Technology** and **Embedded Narrative**. In addition we have written our contribution, **Emergent Mechanics** in bold as well.

Quotes are written as *"quote"* followed by author and page number, unless the quote is used as part of a table, in which case it will be written in the normal font, with the source it was adapted from displayed in the figure caption. Titles of books are written in *italic* with "quotation marks", followed by the source of the book or with the source in the same sentence, as specified by APA6 standards.

Any screenshots from video games are captured by the group, unless anything else has been specified at the individual screenshot.

Video Games can be abstract things to reference. This is because iterations may add significant changes to a game. Because of this abstract nature, we will refer to the newest iteration that we are aware of, of the individual games mentioned during this thesis. In certain cases, it may be necessary for us to reference a certain iteration, in which case the year for that iteration will be mentioned. Likewise, we may need to reference a sequence of iterations in which case the necessary starting and ending year of the game will be mentioned. E.g. World of Warcraft (Blizzard Entertainment, 2004-2016) may be different depending on which iteration of the game is being played.

Special thanks to:

Our supervisor Ole Ertløv Hansen

The Player of Games (Facebook group)

The Academic Employee of AUB Tina Andersen

And the lectors and educators at Interactive Digital Media Aalborg

Kenni Hornstrup *Lars Kiesbye Bendixen* *Peter Skov Madsen*

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Glossary

Aesthetic - The emotions or feelings that a player has when approaching a game.

Dynamics - The idea of the player and the game behaving according to each other during a game.

Embedded Narrative - The narrative that a designer tries to tell the player.

Emerging/Emergent Narrative - The narrative as it unfolds by the hands of the player during play. This can be very unique to the play session and leads to the players Interpreted Narrative; the story as they recall and understood it after play.

Emergent Mechanic - Rationalised design choices made in order to promote certain desirable Emergent- and Interpreted Narratives in relations to Game Mechanics and Embedded Narratives.

Environmental Storytelling - Telling stories or narratives through the use of the setting and the props within it.

Experience - Events unfolding as the player interacts with the game world.

- In a few cases, it refers to it as a game mechanic, in which case it will not be written in bold.

Extra-ludic - A space that actually does not exist in the game in any other way than as part of the narrative or in the mind of the player.

Game - A game is set up by a series of rules for the player to follow in order to be challenged or have fun.

Game Mechanic - A single game rule. E.g. A jump mechanic is a rule that defines how high and how far a character in the game world can jump.

Interpreted Narrative - The story as it unfolded during play and is recalled and understood by the player after play.

Ludic space - Accessible game space, areas that actually exist within the game world, not only in the narrative or in the mind of the player.

Narrative Mechanic - A way of continuing the storyline within a game. E.g. A cutscene or dialogue choices.

Ontic pole - The ontic pole spans between pure game and pure narrative.

Player - Human or Non-human agents that work individually to interact with the game world.

- If not written in bold, then the mentioned player is always used as a general term.

Technology - The technology involved in delivering and producing a video game, such as the machine that runs the game or the game engine; the program in which the game is made and run.

Chapter 1 Introduction

Our main reason for delving into this project is that we enjoy playing games and working with new game ideas. We try to play a wide range of games and challenge ourselves to seek games outside of our preferred genres. This is done to find out more about the rules and mechanics behind them and the types of fun they want us to experience. We will play a game and then play it again to re-experience certain moments and analyse them for future use. Such efforts are part of working on game concepts, as we wish to create our own games in the future. This thesis can be seen as part of our fieldwork to discover our own style of gameplay and level design. Our concept relies on communicating concepts to the player without taking control away from them or using direct methods, like voice or text.

1.1 Motivation

Before we go further into the introduction for the project, we would like to make a short presentation of ourselves and the background that each of us come from, as our focuses during our education have been somewhat different. Two of us have bachelor degrees in Medialogy and the third has a bachelor degree in IT with a focus on business.

One of the students with a Medialogy background has conducted projects regarding visibility in games by the use of light and darkness, adaptive game sound (music and feedback) and educational games. Both the study on adaptive sound and visibility were inspired by an 2010 article looking into sound and music's effect on user experience and psychophysiology response in players (Nacke, Grimshaw, & Lindley, 2010), as well as being an exercise in using statistical analysis for empirical research. The study into adaptive sound and music underlined the need for combining the empirical approach with social research methods, as valuable feedback from test participants regarding perception was not gathered. The study into visibility added an interview on top of automatic data gathering and questionnaires, which showed test participants imbued enemies in the test environment video game with abilities and personalities not at all present in the programed AI. The test used a small game

specifically made for this purpose, two groups played different versions with different light settings. While both versions had very limited visibility, a clear change in player behaviour and movement patterns emerged between the two. The less the participants could see, the more they followed walls and refrained from going into the centre of any larger location. As previously mentioned, players also attributed behaviours to the enemies, which they did not possess, as the darkness seemed to hide the fact they ran on a simple chase mechanic. Test participants instead reported the enemies stalked them and waited for the right time to strike. Seeing this huge impact of the game world and environment on player behaviour was a motivational factor in applying for a Level Designer role in the DADIU program.

The second Medialogy student in the group has worked with games that use different types of input from the player to control the game. The first type of input he worked with was image processing (Moeslund, 2012) where a camera was used with a "special" lens. The lens was made from the magnetic disc part from a floppy disk. This made the camera able to see UV light, which was built into a glove so it could be used as a controller. In this project the book "*The art of game design - a book of lenses"* (Schell, 2008) was used as theory for the game design in the game. The second project worked with voice control input using what is called dynamic time warping (Müller, 2007) to register what word the user used as input. In both the projects a test was conducted with users playing the games, both of these were followed up by a questionnaire to help with the analysis after the tests.

The third member of our group who has a bachelor degree in IT has worked on designing and building user-friendly products for a great variety of users. Two of these projects were concept products made for the companies Siemens Wind Power and NS System. Due to these project concepts being confidential as requested by Siemens and NS System, no details can be explained about the purpose or background for these. The literature that was used the these two projects revolved around theories for globalisation and business strategy such as "*Redefining global strategy: crossing borders in a world where differences still matter"*

(Ghemawat, 2007), "*The Internationalization of Born Globals - An Evolutionary Process?"* (Koed Madsen & Servais, 1996) and *"Competitive strategy - techniques for analyzing industries and competitor"* (Porter, 1980).

Another two projects were about creating and usability testing systems, where the first was a booking system for a pool café and the other was focused on making a game application for smartphones and tablets that could be easily customised for children with autism spectrum disorders. The usability theory used for both of these projects were based on the book "*Object Oriented Analysis & Design"* (Munk-Madsen, Nielsen, & Stage, 2000). Besides usability, the project about the game application included many references to different psychologists, their books and their conferences. To name a few of our many sources and that were used during this project we had the book "*Child Psychiatry"* (Kanner, 1942) as well as frequent visits to Birken kindergarten in Vodskov and the school Egebakken in Aalborg. Both of these institutions are for children with autism spectrum disorders. The goal was to talk to the teachers, leaders and students and develop a game application to fit their needs. We also attended a lecture in Aalborg in October 2012 where lector Cecilia Brynskov from Aarhus University talked about Autism, Applied Behaviour Analysis (ABA) and PECS (A sort of cards with images to help those who cannot speak to communicate).

Besides our different bachelor backgrounds, we have all attended half a year at The National Academy of Interactive Entertainment (DADIU), where we tried our skills with developing games for tablets and were introduced to and taught by people who worked in the video game industry. During DADIU, each of us filled vastly different roles; as game designer, project manager and level designer respectively, divided in two different development teams located in Aalborg.

Our experience makes us biased towards certain aspects within games research. Furthermore having grown up with video games has made us accustomed to certain game conventions and tropes that newer players or outside spectators might not understand. E.g. Players can

get health points back in some games by eating food, as seen in figure 1.1 with examples from the old MS-DOS game Wolfenstein 3D (id Software & Apogee Software, 1992) and a newer instance of the trope in Minecraft (Mojang AB & Microsoft Studios, 2011) almost 20 years later. Because of this, we will try and be self -aware of our use of tropes, although it lies outside our scope to make a detailed analysis of these or explain them to their full extent. Tropes are however as common in video games as it is in other media such as books, movies and series. As such, tropes may be used during examples in this thesis.

Figure 1.1 - Player regaining health by eating food in Wolfenstein 3D to the left (id Software & Apogee Software, 1992) and Minecraft to the right (Mojang AB & Microsoft Studios, 2011).

The game industry has rapidly grown in the past decades. Going from classic pinball and arcade machines to home entertainment systems and computers. Today it is commonplace to play modern social network app games and smartphone games.

According to Interactive Denmark (2015) the revenue in the Danish game industry is growing. The revenue for the game industry in Denmark in 2014 was 1.115.549.000DKK (Interactive Denmark, 2015). Between 2013 and 2014 there was a 36% rise in revenue in the Danish game industry and in the past six years the revenue has seen a 196% gain according to Interactive Denmark's (2015) "Det interaktive Danmark i tal", which is based on "Danske Indholdsproducenter: Film, TV og Computerspil i Tal 2014". This shows that even in Denmark

the game industry is becoming more important as the growth does not seem to be stopping. Many Danish game companies are very small, as they normally only have between one and nine employees according to the numbers from Interactive Denmark (2015).

1.2 Area of Interest

In the previous section, concerning motivation, we inferred how we are interested in implicit influence on players. One such method is Environmental Storytelling, which was our initial point of origin, when beginning to write this thesis. We set out to see how to guide the player, which often is seen as a term coexisting and intertwined with Environmental Storytelling. This brought the work of Henry Jenkins (004) into our attention, which in turn made it clear we needed a framework as a lens to view video games as a whole. We chose to use Paul Ralph & Kafui Monu's (2015) suggested Unified Theory, but in order to ensure the validity of this as the framework, we found the need to compare their definitions to that of other respected authors within video games research and production. We suggest an addition Ralph & Monu's theory, in the form of **Emergent Mechanics**. A definition including the previous aspect of Environmental Storytelling, Guidance and other implicit methods of affecting the player. Following this, we will touch on our initial starting definitions and points of interest, but as our knowledge on the subject increases, the included vocabulary and subjects touched upon increase. Many types of implicit behaviour influencing relies on associations and drawing of attention, as such we will cover form, colour, animation, composition and focus.

Environmental Storytelling

The world in a video game is rarely random. There is a reason why objects are placed the way they are, why they have the colours they have and even the particular light effects around them are there deliberately. Even in a game like Dwarf Fortress (T. Adams & Adams, 2006), where the game creates a new random world of ASCII characters for the player to explore when first starting the game. This is because even though the Dwarf Fortress world is

generated in the start of the game, it still has a set of rules that it must follow. An example of a world that is being generated can be seen in figure 1.2 below. It generates elements such as plants and wildlife depending on temperature and humidity as well as soil and types of minerals in the ground depending on geography. It even features historical events that are being set up depending on the races of the game and the locations the game picks for them. Therefore, even though the game space has just been generated, it now exists as a multidimensional place in the mind of the player. Human brains work by creating series of mental maps, associations and narratives (Crawford, 2005; Jenkins, 2004), meaning we automatically fill in information to the newly generated map, from the information given and information on things and environments we already possess.

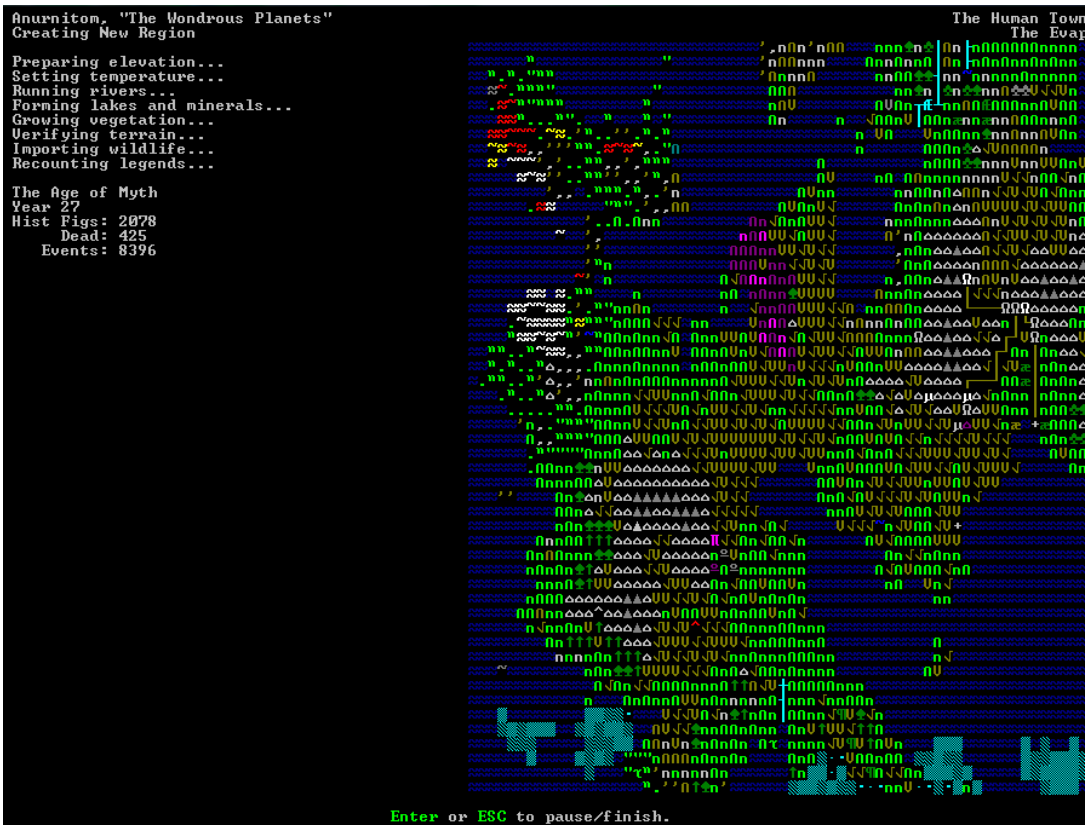


Figure 1.2 - A world being generated in Dwarf Fortress (T. Adams & Adams, 2006).

This brings us to environmental storytelling, where objects tell a story of the player's location and sometimes even what has transpired before the player arrived. To give an example we can look at the game Viscera Cleanup Detail (RuneStorm, 2015), see figure 1.3. In this game, one or more players are tasked with cleaning a location in a game world after a violent event has taken place. The player must wash floors and walls to clean up blood and put skulls, bones and severed limbs into the incinerators. The way the bodies, the blood and broken objects are scattered around rooms will tell stories of what happened in these rooms, how monsters and people killed each other and how monsters first came to attack. Evidence of this can be seen by broken cages, doors and test chambers, essentially just showing how science experiments in a secret facility have gone wrong. The term Environmental Storytelling will be explored further in section 4.6, along with a related and intertwined term; Guidance. However, as Guidance is an essential part of our area of interest we will make a short introduction to it below.

Figure 1.3 - Ingame screenshot from Viscera Cleanup Detail (RuneStorm, 2015).

Guidance

The idea behind Guidance is to catch the attention of the player and make sure that key elements in a game environment is seen. This is similar to movies, where a camera may focus on specific characters or objects in the environment to lead the gaze of the viewer to this area on the screen. In a game, the amount of objects a developer wants the player to see and interact with in a single scene can be complex, even more so if the developer wants the player to find them in a certain order. Guidance consists of an array of different elements, the approach video game designers have and the knowledge background they draw upon to guide the player may vary between them, e.g. cinema, art or animation.

Emergent Mechanic

In order to better fit such terms as Environmental Storytelling and Guidance into previously mentioned Unified Theory (Ralph & Monu, 2015), we suggested inclusion of these aspects under an umbrella term, called **Emergent Mechanics**. **Emergent Mechanics** has previously been used by Ernest Adams (2014) to describe how the player explores and finds weaknesses among the enemies in The Legend of Zelda (Nintendo & Grezzo, 1986-2015). Throughout chapter 3, we look at how different authors perceive and define the terms emergence and **Emergent Narrative**, revealing different attitudes towards if it is behaviour that can be influenced. We decided on the previously mentioned name of **Emergent Mechanics**, since we are under the impression of it being something that can affected, but any such attempt will involve a fundamental degree of uncertainty. We define **Emergent Mechanics** as follows:

> ***Emergent Mechanics:*** *Rationalised design choices made in order to promote certain desirable Emergent- and Interpreted Narratives in relations to Game Mechanics and Embedded Narratives.*

1.3 Problem Area

Gonzalo Frasca (1999) wrote an article suggesting the focus within games research had previously been based around narratives and the game aspect was seen as the lesser, immature field of inquiry. Frasca (1999) suggested the academic field of Ludology and laid out definitions for Paidea (playing), and Ludus (playing with rules and a winner). Meanwhile other models, with roots in a narratological standpoint, such as described in Espen Aarseth 2012 paper "*A Narrative Theory of Games*" (Aarseth, 2012). Aarseth (2012) argues for a gradient between pure game and pure narrative, classifying game and story elements in a ludonarrative model, describing that the more control the player has over the narrative, the less control the author will have. Movies, compared to video games, offer a controlled narrative. The director, cinematographer and editor are able to design the wandering of the audience's gaze at any given time. In games, the more interactive freedom that a developer offers to the players, the less control of the audience's gaze the developer will be left with. This may effectively mean that framing needs to be designed into the game world itself and yet a developer can never be sure the player's experience the narrative the way it was envisioned. Nonetheless, the designer might be able to implicitly influence how players behave or perceive the game world. Chris Crawford (2005) writes that we learn by association and that stories are not isolated facts, but rather a series of associated facts, events and interactions. While it might not always be a possibility to design specific instances of player experiences, video games offer the possibility of creating a setting for players to explore and puzzle together the narrative on their own. So if a game offers large amounts of freedom to the players, it might not make sense to divide a narrative into kernels and satellites (Aarseth, 2012), as the player might need the sum of all the parts in order to immerse themselves fully into the experience. Furthermore, if the ludological elements are not consistent with the narrative aspect of a game, it can create a ludonarrative dissonance, ruining player experiences. Any understanding of video games seem to require understanding of a wide variety of different theoretical frameworks, from narrative mechanics to player immersion. Due to this, we will be searching for established or suggested theories that unifies the ever-growing body of academic work done towards understanding video games and their design.

We see this as an opportunity to look at Environmental Storytelling and implicit influence through a lens that sheds light on games in their entirety and then filter the gathered knowledge to get a deeper understanding of our problem field.

1.4 Problem Statement

The goal is to gain an initial understanding of how to affect player behaviour, without taking control of the player's actions or leading them with communication that is too explicit, e.g. including a user interface arrow, constantly guiding the player to the next point of interest. This leads us to our problem statement:

> "*Indirect methods, such as Environmental storytelling, can be used in video games to enhance the experience of the gameplay and narratives. The designer can enable certain interactions and encourage exploration in order for the player to be able to discover self-contained stories as well as gaining understanding of the game world and the game mechanics within it*"

The problem statement serves as the foundation, in order to make a series of research questions that leads our research towards its goal.

Research questions

1. *How do video games relay narratives and enjoyment, and in what way do different aspects of the video game experiences work in conjunction with one another?*
2. *Which narrative mechanics are used to indirectly emphasise video game narratives and are these indirect methods represented in video game models?*
3. *What can be used to indirectly emphasise video game narratives outside fields of study or content production?*
4. *How are non-fundamental elements of video game mechanics or narratives represented and functioning within video game design?*

Chapter 2 Method and Approach

In this chapter, we will explain the research methodology we have used in this project and take a look at the project management tools used, such as Scrum (Pichler, 2010). Additionally, we will outline our approach to literature, a so called Snowball technique (Ridley, 2012). Furthermore, we take a look into the theory we use as a framework for this project, a proposed Unified Theory of video games by Ralph & Monu (2015) and how it evolved from prior models. We will also be taking a look at the Classic Game Model by Jesper Juul (2005).

2.1 Research Methodology

Researching a new media like video games is a complicated process, because it is not yet well defined, due to it being a still rapidly evolving medium. We will arrange our references and citations using the program Zotero (Roy Rosenzweig Center for History and New Media, 2006) to sort all of these after the method APA6. Our research method will be mostly influenced by "*The Literature Review"* by Diana Ridley (2012) and we use the book "*Systematic approaches to a successful literature review"* (Booth, Papaioannou, & Sutton, 2012) as a way of confirmation. In order to research this area of interest we therefore look to other researchers. Some may take inspiration from other media such as literature, board games or movies and compare it to the video games, while others may create their own games and test them to try them against various theories. First and foremost we will be using academic sources during this project, but we may also bring in data and articles based on grey literature (Booth et al., 2012; Ridley, 2012), which most often will be from a developer viewpoint and in some cases from related media relevant to game development, e.g. animation or cinema. In our theoretical framework, grey literature will only be used if this can be backed up by academic sources. Outside of the theoretical framework, we will not restrict ourselves on material that has been insufficiently covered by academic literature. Our use of grey literature will primarily be to identify new areas, which have yet to be covered adequately by academia.

We want the thesis to be as easy to read as possible and because of its size we want each chapter, following this one, to end with a summary or a conclusion. This way the reader will be able to transition from one chapter to another with an overview of the intended topics that have been mentioned.

2.1.1 Searching for Sources

In order to find sources for our thesis we have been in contact with the Aalborg university library and asked them to help us search for written material. We have also received material and advice from our supervisor and used literature that we were made aware of through our education. In the snowball technique (Booth et al., 2012; Ridley, 2012) we started reading the found material and looked at what authors were cited in bibliographies in connection with our research points of interest. We used this to continuously make our research more targeted and specific.

The snowball technique is a commonly used technique to find literature within a field according to Ridley (2012). This is done by looking at the bibliographies of articles or books found within the area of interest and looking at their sources to find previous work on that specific topic (Booth et al., 2012; Ridley, 2012). This technique was used by our group after reading the article written by Ralph & Monu (2015) called "*Toward a Unified Theory of Digital Games"* where we would start to look at the references used in the article. From here we found several authors known within the field of study, which we decided to look further into, in order to help us get a better understanding of the Unified Theory. Doing this led us to authors such as; Jesper Juul, Espen Aarseth, Henry Jenkins, Richard Bartle, Jesse Schell and Katie Salen & Eric Zimmerman. With continued use of the snowball technique, we ended up finding additional authors such as Chris Crawford as well as other articles made by authors that were previously mentioned.

We worked in a literature review process (Ridley, 2012) as illustrated in figure 2.1 below. We started using this process when writing chapter 3, where we went through a large quantity of theories that were within our area of interest. When we first started designing this chapter our main focus was to use Jenkins (2004) to better understand Environmental Storytelling. Later in the writing process we found the Unified Theory by Ralph & Monu (2015), which in generally was a better fit on the subject we wanted to work with. Furthermore, in the article by Ralph & Monu (2015), Jenkins (2004) was used as a reference for their work. This moved the process from Environmental Storytelling to implicit methods that we later named **Emergent Mechanics**. Overall, this did not change much because Environmental Storytelling is a subgroup of **Emergent Mechanics**, which widened our research area.

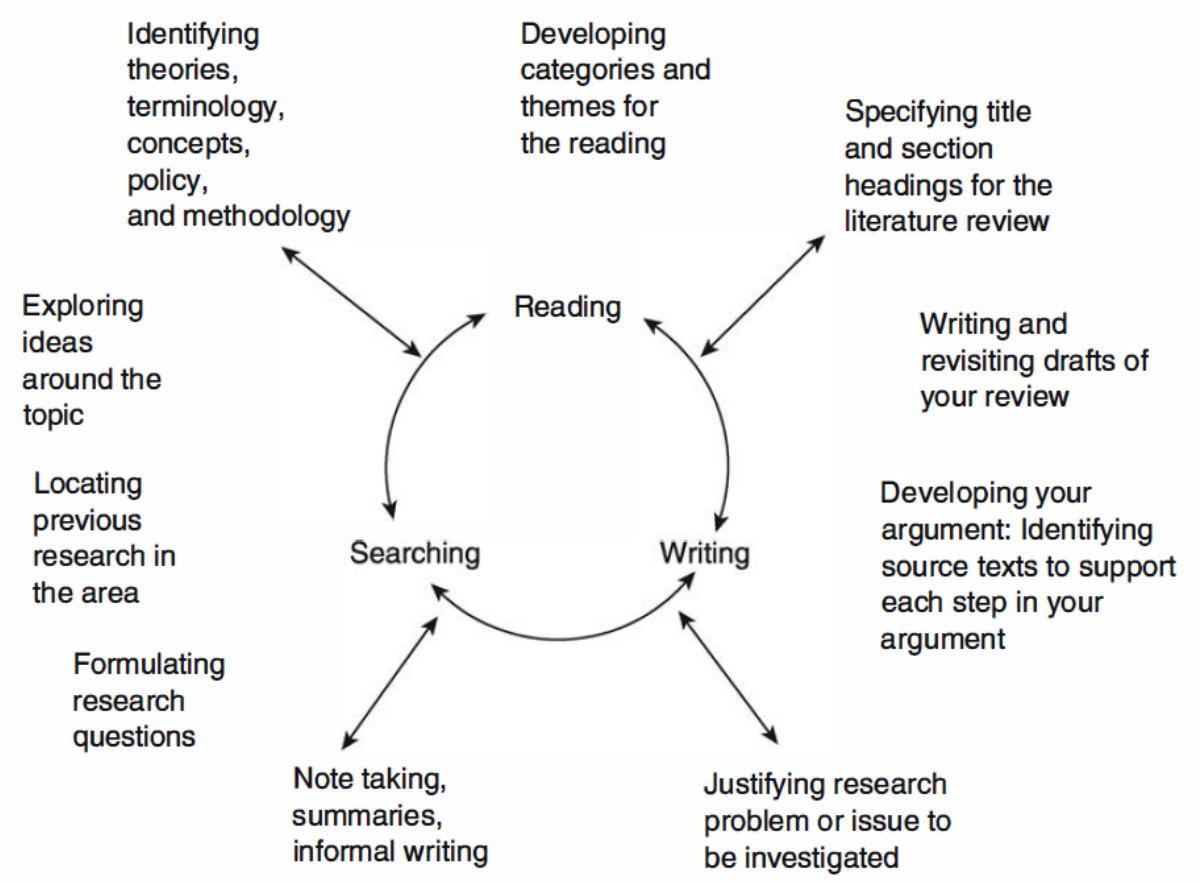


Figure 2.1 - The literature review process from Diana Ridley's (2012) book "The Literature Review".

Inspired by the model in figure 2.2 which can be seen below, we searched in various fields of interest and found intersecting concepts in order to learn more about video games research. We did this to collect as much knowledge as possible about the area, however there is an overlap with authors used by Ralph & Monu (2015) in the creation of the Unified Theory. We used this to further expand on the knowledge in this area and compare this in order to better understand what we ended up calling **Emergent Mechanics**.

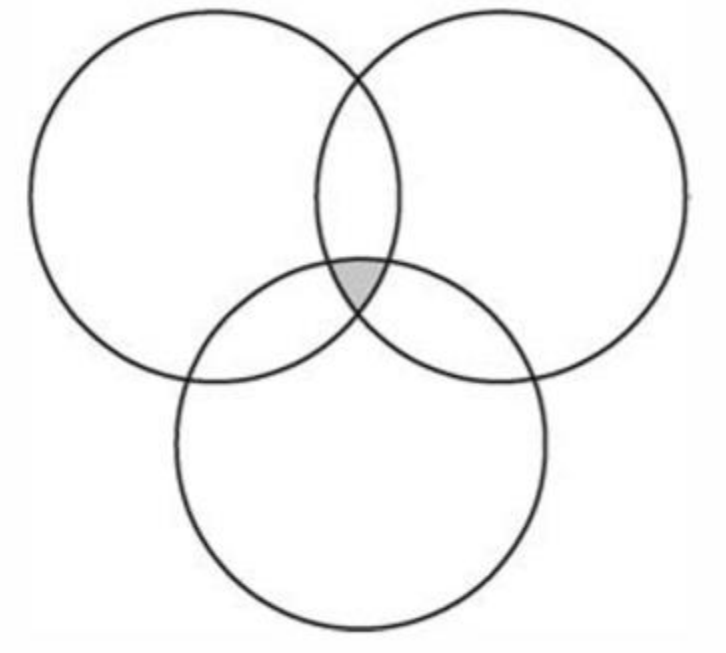


Figure 2.2 - Finding intersections from Diana Ridley's (2012) book "The Literature Review".

In order to help sort and categorise our sources we used a modified version of the KJ-Technique/method (Spool, 2006). Normally the KJ method requires putting data or opinions on sticky-notes and grouping them together. In our case we instead wrote theories and terms used by other authors in our own words and grouped these after how they would fit in Ralph & Monu's (2015) previously mentioned theory as seen in figure 2.3. Not only did this method simplify how different authors used terms, but it also inspired us to how Ralph & Monu's (2015) theory could be improved. This would become the addition of the aforementioned **Emergent Mechanics** to the theory.

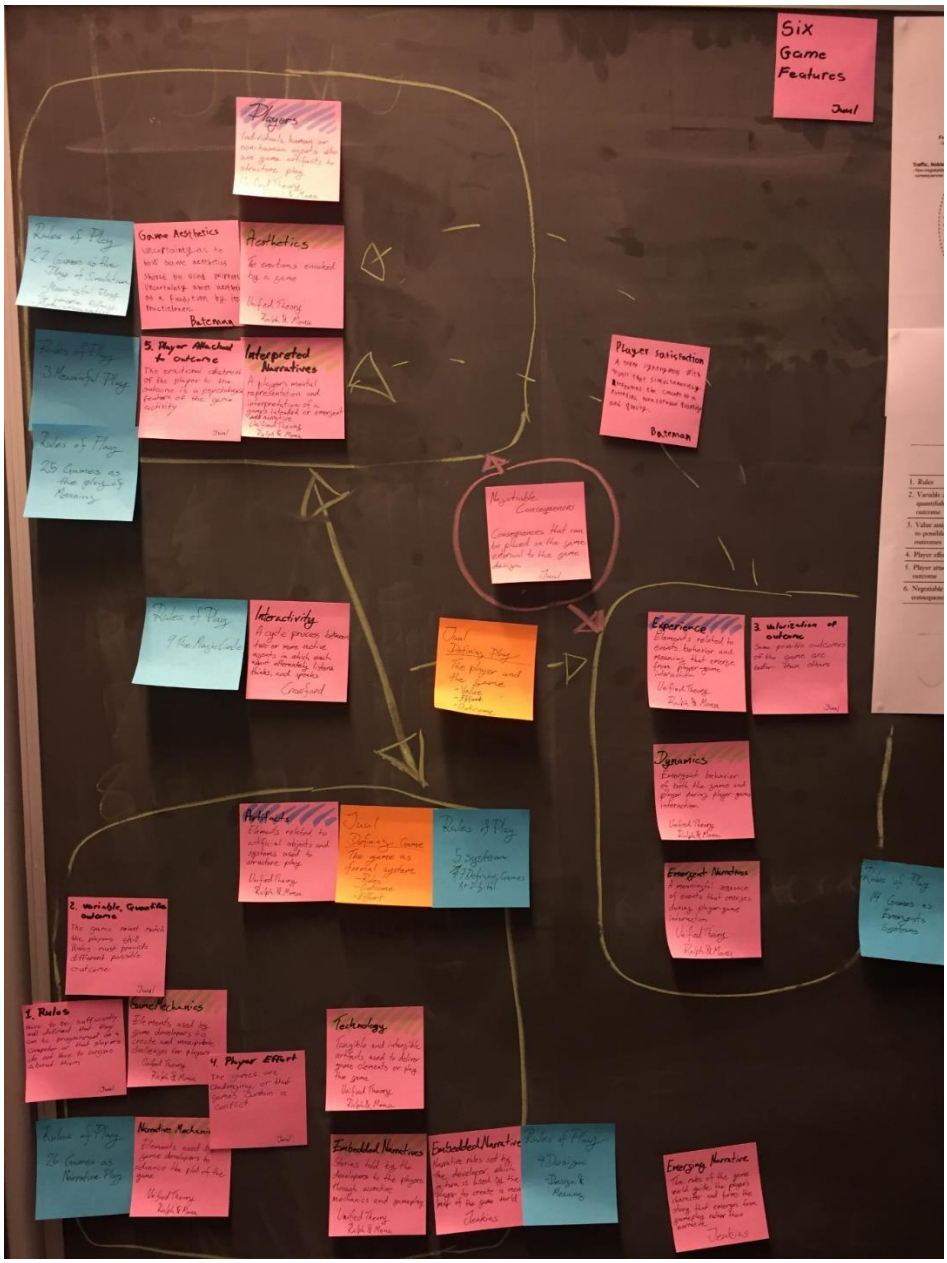


Figure 2.3 - Categorisation and mapping of sources.

Throughout this project we have done what is called critical reading and writing (Ridley, 2012). This can be seen in chapter 3, where we take a look at the background and knowledge behind the Unified Theory (Ralph & Monu, 2015) and reaffirm this as critical writing by

challenging it with its original sources and other authors definitions. We do this to cross-reference the sources that has been used and to further investigate the area between **Game Mechanics** and **Narrative Mechanics** that we have later decided to call **Emergent Mechanics**.

2.2 Literature Approach

Our initial goal was to gain insight into narratives and Environmental Storytelling, a topic that we had the impression was mainly covered within industry and animation sources. Our literature approach started within the sources we had gained through the Interactive Digital Media master's program as well as library searching while using key terms such as: *"Environmental Storytelling"*, *"Guidance"* and *"Spatial Storytelling"*. This quickly made us aware of Jenkins (2004) article *"Game Design as Narrative Architecture"*, but terms such as Environmental Storytelling seemed to be primarily used in industry circles rather than academic sources. This put us in a situation where we needed to figure out where Environmental Storytelling fit within the framework of video games. In other words, we needed an overall model of video games in order to see where the concept of Environmental Storytelling fit with other elements and techniques. In addition, we became aware of other concepts of indirect storytelling that did not seem to be accounted for within the literature we already were aware of, such as the understanding of shapes, weight in animation and the composition of Mise-en-scene. So in order to fill any gaps, we needed to find a viable model, validate the integrity of this and use this as a lens to fit in the indirect narrative and gameplay mechanics. For this we chose the newly formulated suggested unified theory from Ralph & Monu (2015) in their paper "*Toward a Unified Theory of Digital Games*".

As previously mentioned chapter 3 is dedicated to comparing the definitions of the Unified Theory against established researchers and authors on the subject of video games. This is done to both check the validity of the Unified Theory, as well as gaining an understanding on how the previously mentioned narratives and environmental storytelling works within this

framework. The authors that are used generally refer to one another in their work, but have different viewpoints as to which aspects of video games encompasses certain definitions. We were introduced to many of the authors through our education, and we attempt to be critical towards their writings by doing these comparisons in chapter 3 according to the critical reading/writing methods (Ridley, 2012). There is an additional layer of internal criticism towards each author, by doing comparisons to both professional and personal experience, such as through the understanding gained from the DADIU program as well as years of understanding from playing video games. Some literature recommendations come from game design circles on online fora and social networks that we have received through DADIU, e.g. Katie Salen & Eric Zimmerman seems to be prominent in both of these, as well as in our education at Aalborg University. The same goes for Henry Jenkins, who has mainly been included in our education for his work on transmedia.

One of the students behind this thesis has previously based a project on writings by Henry Jenkins. More specifically regarding Jenkins work on transmedia. It is specifically his broad approach to the subject of media that we felt needed representation, when working with video games in the broadest sense. We used his article *"Game Design as Narrative Architecture"* (Jenkins, 2004) as a stepping stone in the beginning of the project, and have continuously compared and measured his assertion against the other authors included in this thesis.

The included section 3.1.2 with Espen Aarseth could be considered as an outlier compared to some of the other authors included in this thesis. But as a respected researcher on video game narratives, and with the term narrative being a recurring theme in Ralph & Monu's (2015) theory, we felt we needed at least an understanding of his work to weigh it against the definitions in their theory.

Katie Salen & Eric Zimmerman's prominence is evident from how often they are referred to and how positively their book "*Rules of Play"* (Salen & Zimmerman, 2004) is reviewed. GameDevelopers.ie wrote: *"...but why should you read this book? Because it will change your life."* (Kücklich, n.d.). The duo behind the YouTube series ExtraCredits (Floyd & Portnow, n.d.), the game developer James Portnow and animator Daniel Floyd, listed "*Rules of Play*" (Salen & Zimmerman, 2004) as a must read book in regards to game design. Our own opinion of the book is also positive, but as with anything written on an ever changing subject, we have to at least consider the changes that has happened to video games since the books was released such as the rise of Indie development and Virtual Reality.

Jesper Juul is not only a respected researcher when it comes to video games, he was also teaching game design during the competence weeks at DADIU. Now he is leading a new master's education program in Denmark. Furthermore, Juul's (2005) book *"half-real"* features subjects that have turned out to be relevant during our project.

E. Adams' (2014) book, *"Fundamentals of Game Design"*, can to some degree be considered a "How-to" guide. But Adams does not only have years of experience within the video game industry, he has also obtained a Ph.D. since the first edition of his book was published, underlining his knowledge and recognition on the subject.

2.3 Project Management Tools

Throughout the project, we have used various tools to structure our workflow and keep an overview of where we were going. However, as with Scrum (Pichler, 2010), which we will elaborate on in the following section, we have been taught such methods are hardly ever used in their purest form, they are always adapted to the situation and the workflow at hand. Nonetheless, the knowledge behind such techniques work as the foundation to produce an efficient workflow. A large aspect of an agile project is the unclear path and unfamiliarity with what the final goal may end up becoming as the project is underway. Another unfamiliarity is what requirements will rise to the surface, as we delve into uncovering what information we lack to answer our own questions. Any path laid out from the beginning may very well end up not being the road travelled as the project and scope may change when working with an agile method.

2.3.1 Scrum

In this section we will write about the use of Scrum in our project, we will mainly use the book "*Agile product management with Scrum: creating products that customers love"* by Roman Pichler (2010). Even though this project has not been about creating a software product we still chose to use Scrum to plan our process.

Scrum is an agile project management method that helps a team to work with parameters that constantly change. By being able to quickly change direction, the method helps the team when they need to adapt. This is done in order to easily change the process if the timeframe changes. In Scrum there are three main roles that are central to the method; the product owner, the development team and the Scrum master (Pichler, 2010).

The product owner

It is the product owner's responsibility to make sure that the development team are in contact and communicate with relevant stakeholders for the project. It is also the product owner’s responsibility to have the end user in mind and to make sure that the product fulfils all their requirements. Furthermore, the product owner has to give methodical feedback to the development team and help with the development of the backlog. The backlog is a prioritised list of all the requirements that are needed to successfully deliver the final product. This is to ensure that the development team can deliver a product that fulfils all the requirements.

The development team

The development team’s responsibility is to make the product or concept for the product owner. The development is done in what is called sprints, which will be explained later. A Scrum development team is made up of people with different skills. These skills will matter when distributing tasks among the team members.

The Scrum master

The Scrum master is there to help the development team identify and overcome challenges during the project. Additionally the Scrum master is there to make certain the team stays on schedule in order to meet deadlines and deliver the final product on time. That way the Scrum master works as a coordinator, making sure that the team is always on track. It is recommended that the scrum master is someone who is not a part of the development team. Instead, the Scrum master is functioning more as an observer to make sure that the development team follows the Scrum rules that have been set.

When using Scrum the team works in sprints as mentioned earlier. Each sprint can last up to 30 days but normally only lasts for about a week. Each sprint starts with a planning session of what needs to be done in the duration of the sprint and who in the development team gets which tasks. The active tasks are known as the sprint backlog. Furthermore, in the initial planning phase of a sprint the previous sprint will be evaluated and tasks that have not been completed before deadlines will be discussed to plan how and when they can be completed. Each morning throughout a sprint is started with a short Scrum meeting. This is a meeting where each member of the development team explains how they are progressing compared to their schedule and what they need in order to complete the task at hand.

Our Scrum

In our group, we have modified the use of Scrum to fit our project. The biggest notable difference is that Scrum in our case will not be used to create a software product, but instead an addition to an already existing model, the Unified Theory (Ralph & Monu, 2015). In this project, Scrum was used to help the group coordinate tasks such as reading literature and writing the thesis. In order to do this, all material were written down on post-it notes that were then sorted into a pile depending on their priority. Every time someone from the group started reading a new book or article, a post-it note would be placed on our Scrum-board under his name. This way all members of the group knew who was reading what, as well as what material still had to be studied. Every morning throughout the project we had a daily meeting about how far each person were with their tasks and if they had any findings or sources from the literature worthy of further investigation. Furthermore, these meetings were used to talk about what was needed in order to keep progressing and what literature was important to analyse first or to compare with other literature. To keep track of literature, notes with terms and theories from books and articles were placed on the model, which was built from our KJ method as mentioned previously in this chapter. Besides the Scrum meeting we also had a list that could be viewed as a product backlog, where the product backlog in our case is the books that needed to be read and the thesis that we have to be complete. In this backlog, we listed the written material that we knew of or believed that we would need

to look into during our project, as well as a constantly growing list of elements to include in the chapters of our thesis.

2.3.2 Treasure Map

Early in the project process, after a few iterations, we made a project journey map, which we called our treasure map. The purpose of this map was to make sure that everyone in the group knew what we wanted to achieve and to form easily memorable associations. If we look at figure 2.4 below, we see the very first draft of this map. The map is based on the Unified Theory by Ralph & Monu (2015) and shows the direction that we wanted to move, in order to answer our research questions.

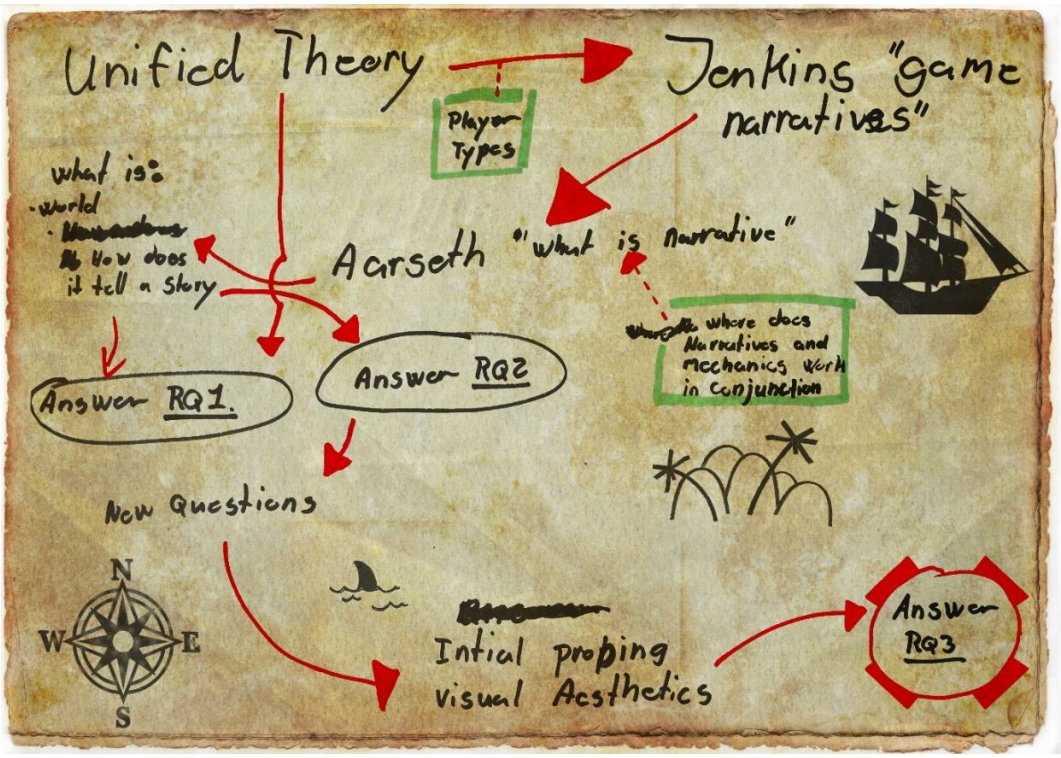


Figure 2.4 - First draft of treasure map. RQ was used as an abbreviation for Research Question.

As we moved forward with the project and gained more knowledge about the subject, we updated the layout of the map, as seen on figure 2.5. As shown, we still use player types although we changed how they have been used in the project as it now has a category of its own. Furthermore, in this latest version, the scope of the thesis has been expanded with an additional research question, which is a subject that we decided to cover during a sprint, as it was something that we felt we needed to expand upon.

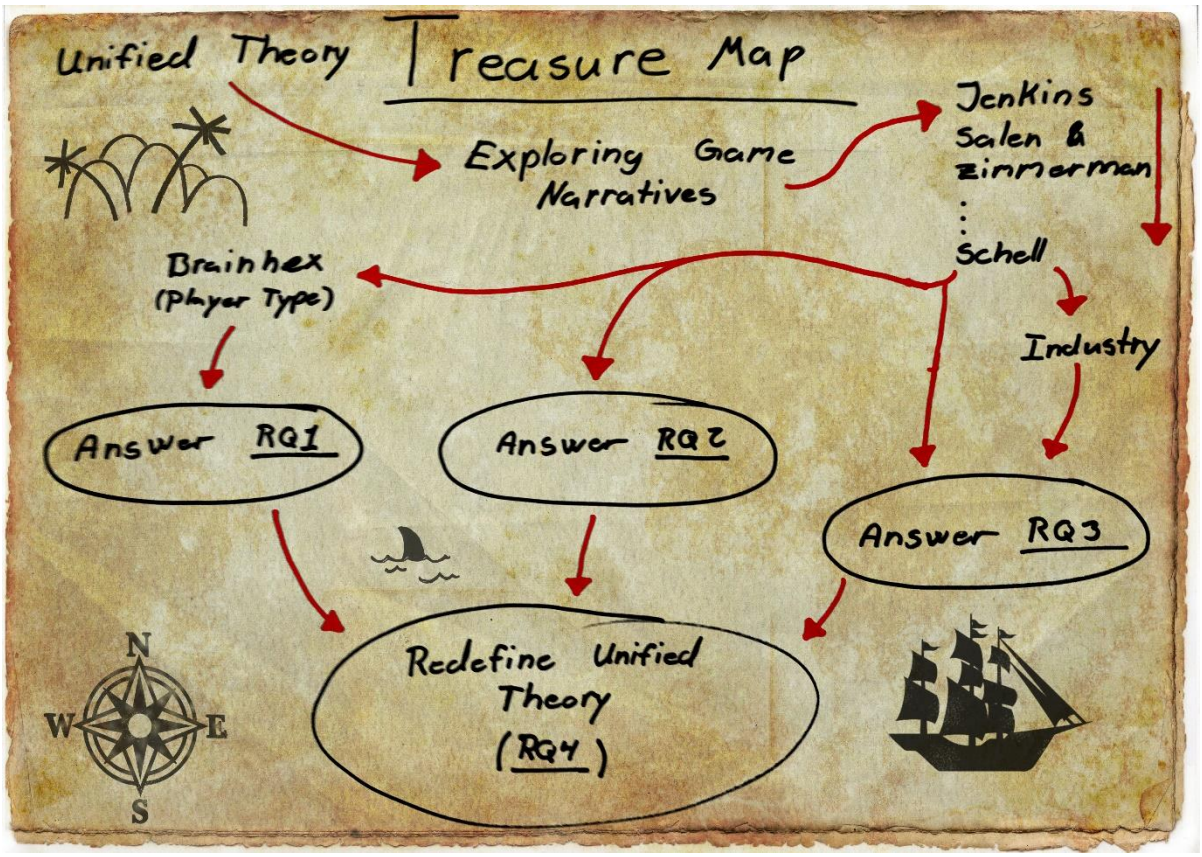


Figure 2.5 - Finalised treasure map.

While the treasure map explains the process of answering the research questions, the process for the thesis itself can be presented as more linear. Yet, in order to confirm several elements, some chapters will work in conjunction with other chapters. Figure 2.6 is an illustration of how the different chapters attempt to verify elements from other chapters throughout the

thesis. The bulk of the thesis, chapter 3, is dedicated to the verification of the Unified Theory (Ralph & Monu, 2015) and comparison of used definitions in the theory to sources both from academia and the video game industry.

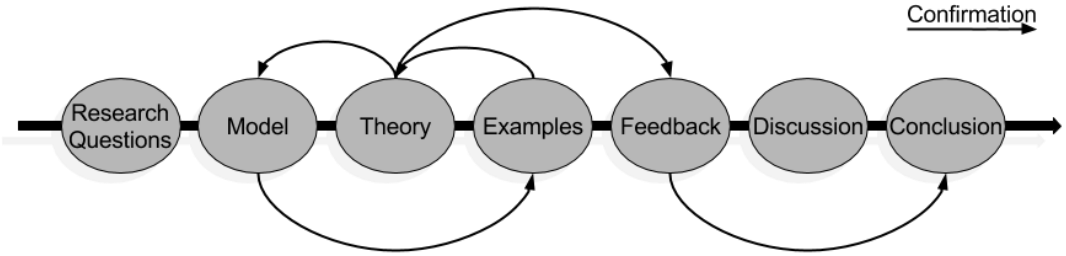


Figure 2.6 - Relationship between chapters throughout the thesis.

The conclusion made in chapter 3 is then brought forward and further explored, verified and discussed throughout the thesis. Many of the chapters also include smaller discussions and conclusions based on problems or aspects that are relevant to their individual topics as they arise. This springs from the chosen method, see section 2.2, as well as the need to answer smaller, related questions, as they may be hard to fit in at larger convergence points in the thesis.

2.3.3 Calendar

We made a calendar where each month of the semester was put on a piece of A3 paper, and placed on a board in our group room, see figure 2.7 below. We made this to keep track of important dates for the group, to be able to plan in cases where a member of the group had to go early or in cases of supervisor meetings. This was a great planning tool, as it allowed us to plan forward during every morning meeting and thus helped us stay within scope when selecting tasks from our product backlog.

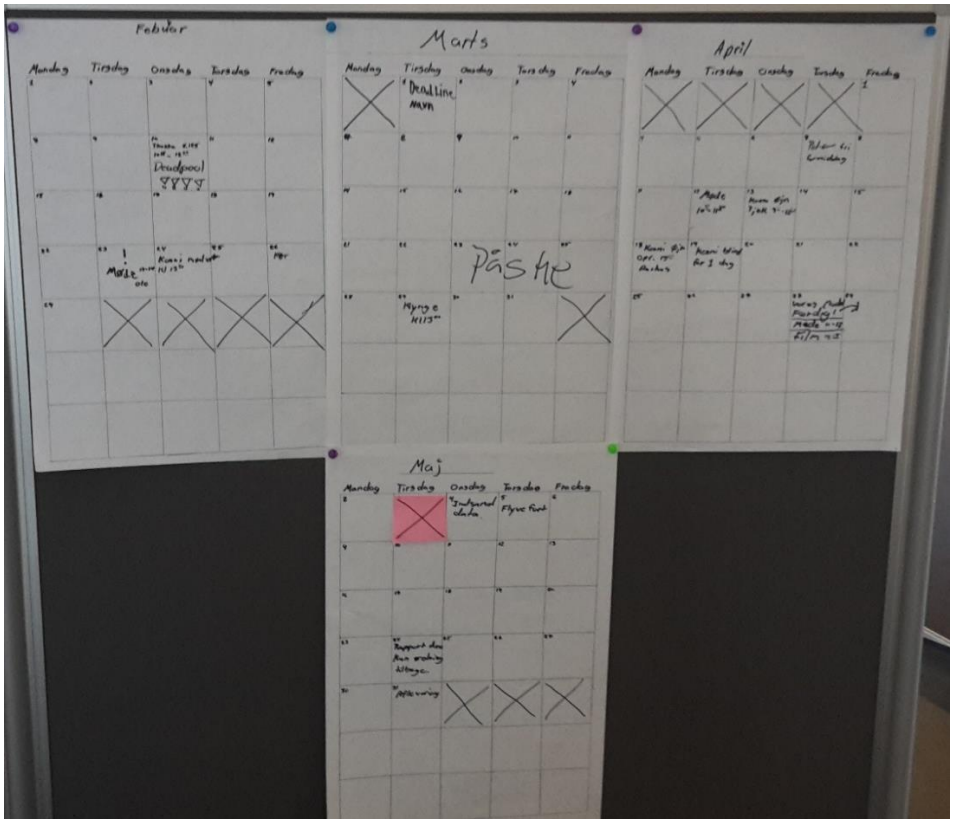


Figure 2.7 - The group calendar.

2.4 Unified Theory of Digital Games

Before we explore how the Unified Theory defines video games, we need to establish what defines a game. In order to do so we turn to Jesper Juul.

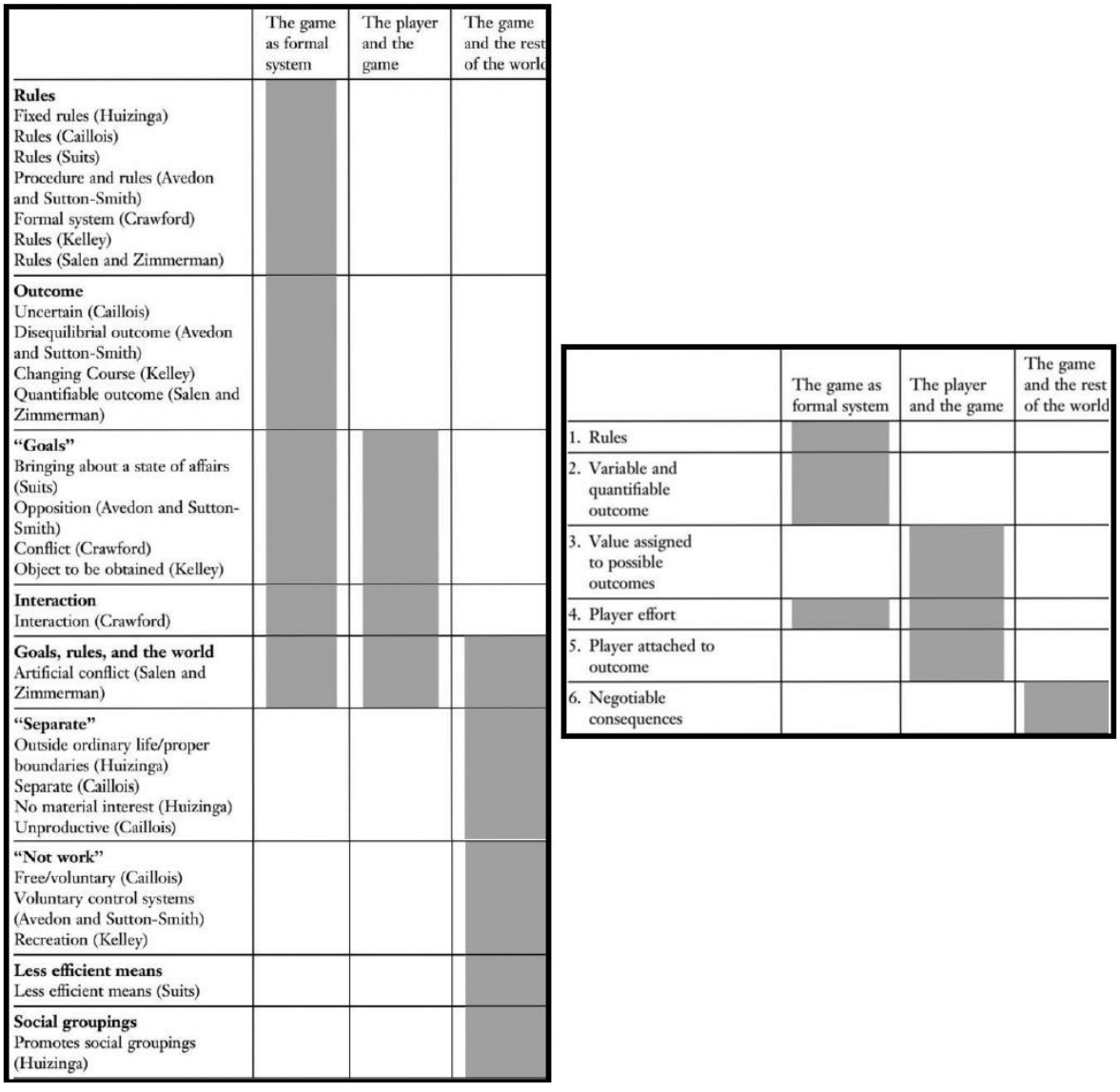
Classic Game Model

In Juul's (2005) book "*half-real*", he describes what games are and how we define them. Initially he made comparisons between the definitions provided by his peers. He lists different definitions from different authors, like Crawford and Salen & Zimmerman. These were used to compare game definitions, see figure 2.8, which he later integrated into his own interpretation. Juul proposes the following game definition, see the list below and figure 2.8.

1. *"**Rules**: Games are rule-based. "*
2. *"**Variable, quantifiable outcome**: Games have variable, quantifiable outcomes. "*
3. *"**Valorization of outcome**: The different potential outcomes of a game are assigned different values, some positive and some negative. "*
4. *"**Player Effort**: The player exerts effort in order to influence the outcome. (Games are challenging.) "*
5. *"**Player attached to outcome**: The player is emotionally attached to the outcome of a game in the sense that a player will be a winner and be "happy" in case of a positive outcome, but loser and "unhappy" in case of a negative outcome. "*
6. *"**Negotiable consequences**: The same game [set of rules] can be played with or without real-life consequences. "*

(Juul, 2005, p.36).

As seen in figure 2.8 below, Juul (2005) plotted his six features into the three categories of definitions from other authors within the area. From this Juul (2005) made the Classic Game Model to visualise the six features, see figure 2.9. The model explains that there are some borderline cases, e.g. SimCity (Maxis, 1989), which has no fixed goal, but rather serves as an endless playground (Juul, 2005). The playground aspect is often referred to as sandbox games among gamers, inferring the Paidea nature of their gameplay (Frasca, 1999).



	The game as formal system	The player and the game	The game and the rest of the world
Rules Fixed rules (Huizinga) Rules (Caillois) Rules (Suits) Procedure and rules (Avedon and Sutton-Smith) Formal system (Crawford) Rules (Kelley) Rules (Salen and Zimmerman)	■		
Outcome Uncertain (Caillois) Disequilibrial outcome (Avedon and Sutton-Smith) Changing Course (Kelley) Quantifiable outcome (Salen and Zimmerman)	■		
"Goals" Bringing about a state of affairs (Suits) Opposition (Avedon and Sutton-Smith) Conflict (Crawford) Object to be obtained (Kelley)	■	■	
Interaction Interaction (Crawford)	■	■	
Goals, rules, and the world Artificial conflict (Salen and Zimmerman)	■	■	■
"Separate" Outside ordinary life/proper boundaries (Huizinga) Separate (Caillois) No material interest (Huizinga) Unproductive (Caillois)			■
"Not work" Free/voluntary (Caillois) Voluntary control systems (Avedon and Sutton-Smith) Recreation (Kelley)			■
Less efficient means Less efficient means (Suits)			■
Social groupings Promotes social groupings (Huizinga)			■

	The game as formal system	The player and the game	The game and the rest of the world
1. Rules	■		
2. Variable and quantifiable outcome	■		
3. Value assigned to possible outcomes		■	
4. Player effort	■	■	
5. Player attached to outcome		■	
6. Negotiable consequences			■

Figure 2.8 - Compared game definitions (Left), Juul's six features (Right) (Juul, 2005, Chapter 2, p. 32-37).

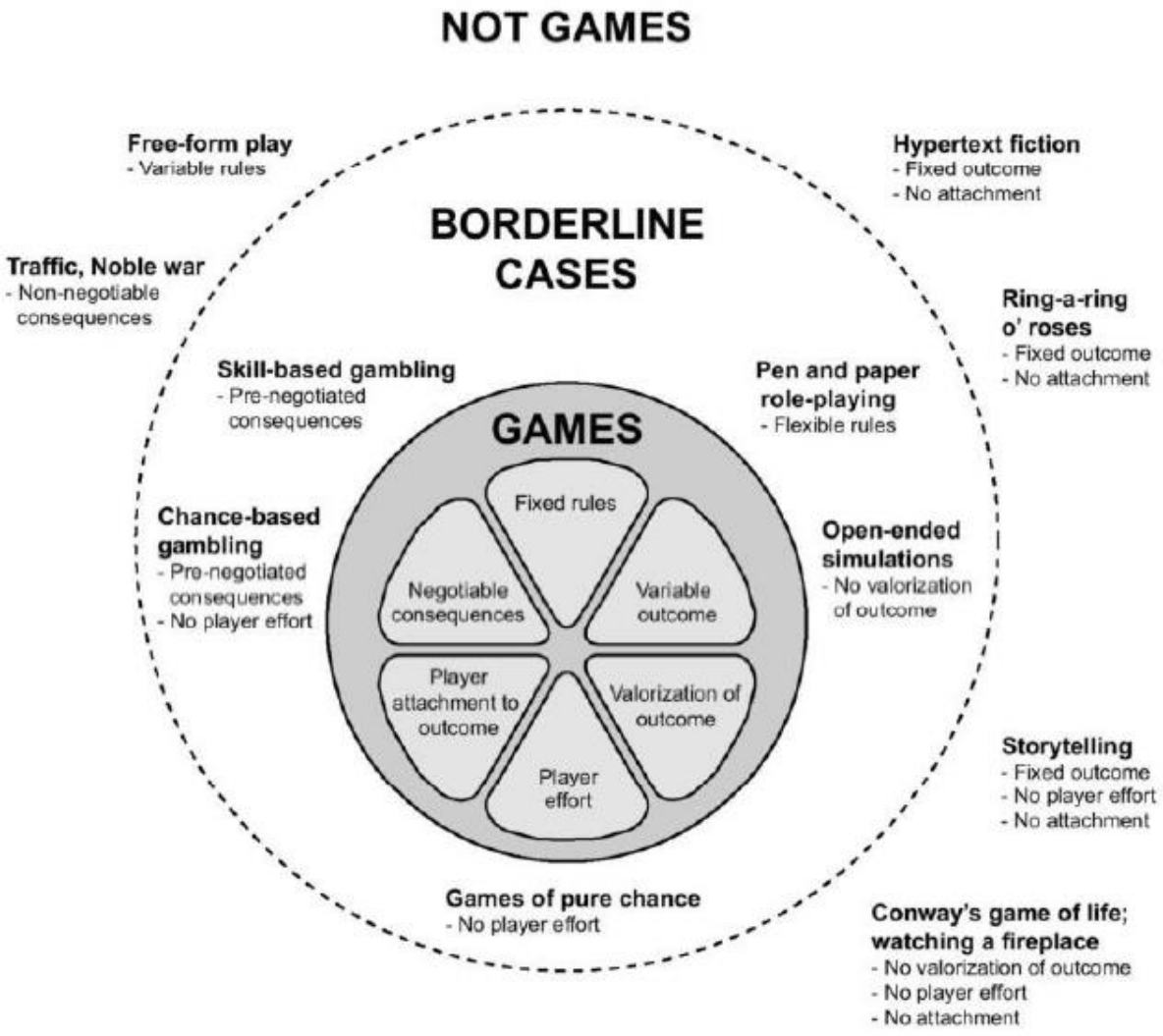


Figure 2.9 - The Classic Game Model, from Jesper Juul's book "half-real" (Juul, 2005, p.44).

With a definition for what defines a game, we will turn our focus towards how the Unified Theory (Ralph & Monu, 2015) evolved into what is describe in the following part, since this model will function as a lens, which we use to describe the interaction between players and video games.

Evolution of the Unified Theory

In many ways a video game can be seen as more than the sum of its parts. To complicate matters further, the video game medium is capable of incorporating visual and narrative techniques from most other media. We have chosen to look at the medium through the lens of Ralph & Monu's (2015) suggested Unified Theory of Digital Games. While the focus of this thesis is towards the **Embedded-**, **Emergent-** and **Interpreted Narratives** creating Environmental Storytelling, this theory also involves other aspects of video games such as Mechanics and Aesthetics. The Unified Theory attempts to identify the foundational classes that come together to create any video game.

The Unified Theory has among other things sprung from the MDA framework (Hunicke, LeBlanc, & Zubek, 2004) and the Elemental Tetrad (Schell, 2008). It has also seen refinement through feedback from researchers, developers and players alike. The MDA framework consists of three components; *Mechanics, Dynamics and Aesthetics*, and how these are perceived in an opposite manner by Designers and Players (Hunicke et al., 2004), see figure 2.10 below.

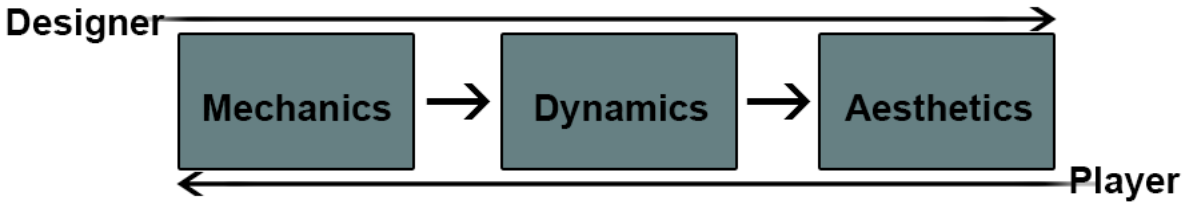


Figure 2.10 - MDA framework visualised, from the article "MDA: a formal approach to game design and game research" (Hunicke et al., 2004).

What is peculiar about the MDA framework is the absence of narrative as a key element. Instead it is placed under the category of Aesthetics (Hunicke et al., 2004). Other researchers approach to game Aesthetics defines it as player satisfaction, styles and types (Bateman, 2014). This approach seems to have left narratological aspects as a discipline entirely outside the model. In contrast, Jesse Schell's Elemental Tetrad includes narrative (Story) as one of four elements: Aesthetics, Mechanics, Story and Technology (Schell, 2008). However Jesse Schell's definition of Aesthetics is more towards the everyday definition: The look and feel of the game (Schell, 2008). This makes sense in his model, as each element is placed on a gradient of how visual they are to the player, see figure 2.11 below.

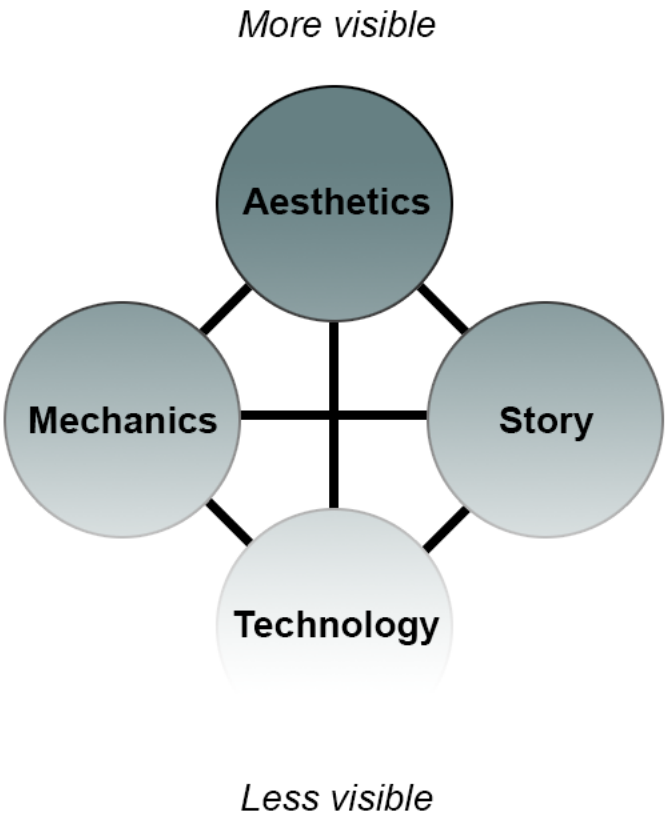


Figure 2.11 – A visualisation of Schell's (2008) Elemental Tetrad.

The Unified Theory (Ralph & Monu, 2015) refines the previous models by combining and nuancing the different elements. Both MDA (Hunicke et al., 2004) and The Elemental Tetrad (Schell, 2008) recognise **Aesthetics** as being the most visible aspect to the player, as such under the Unified Theory they have been placed as a sub-class within a **Player** class. The reason for placing **Aesthetics** as a sub-class is to emphasise the importance of the **Players Interpreted Narrative** in conjunction with the **Aesthetics**. This acknowledgment of the importance of narratological elements in video games is recurring throughout the other classes as well, those being **Experience** and **Artifacts**. **Experience** comprises of **Dynamics** and **Emergent Narrative**, underlining any emergent behaviour within the video game. This creates the **Emergent Narrative** as the player-game interaction unfolds. The **Artifacts**-class contains everything designed to deliver the **Experience** to the **Player**: The **Game Mechanics**, overlapping with **Narrative Mechanics**, the **Embedded Narratives** and the **Technology** used to design and deliver the **Experience**. The interaction between the **Player** and the game **Artifacts** is what creates the **Experience**. This **Experience** then creates the **Aesthetics** and **Interpreted Narrative** of the **Player**. A visual representation of the Unified Theory can be seen in figure 2.12.

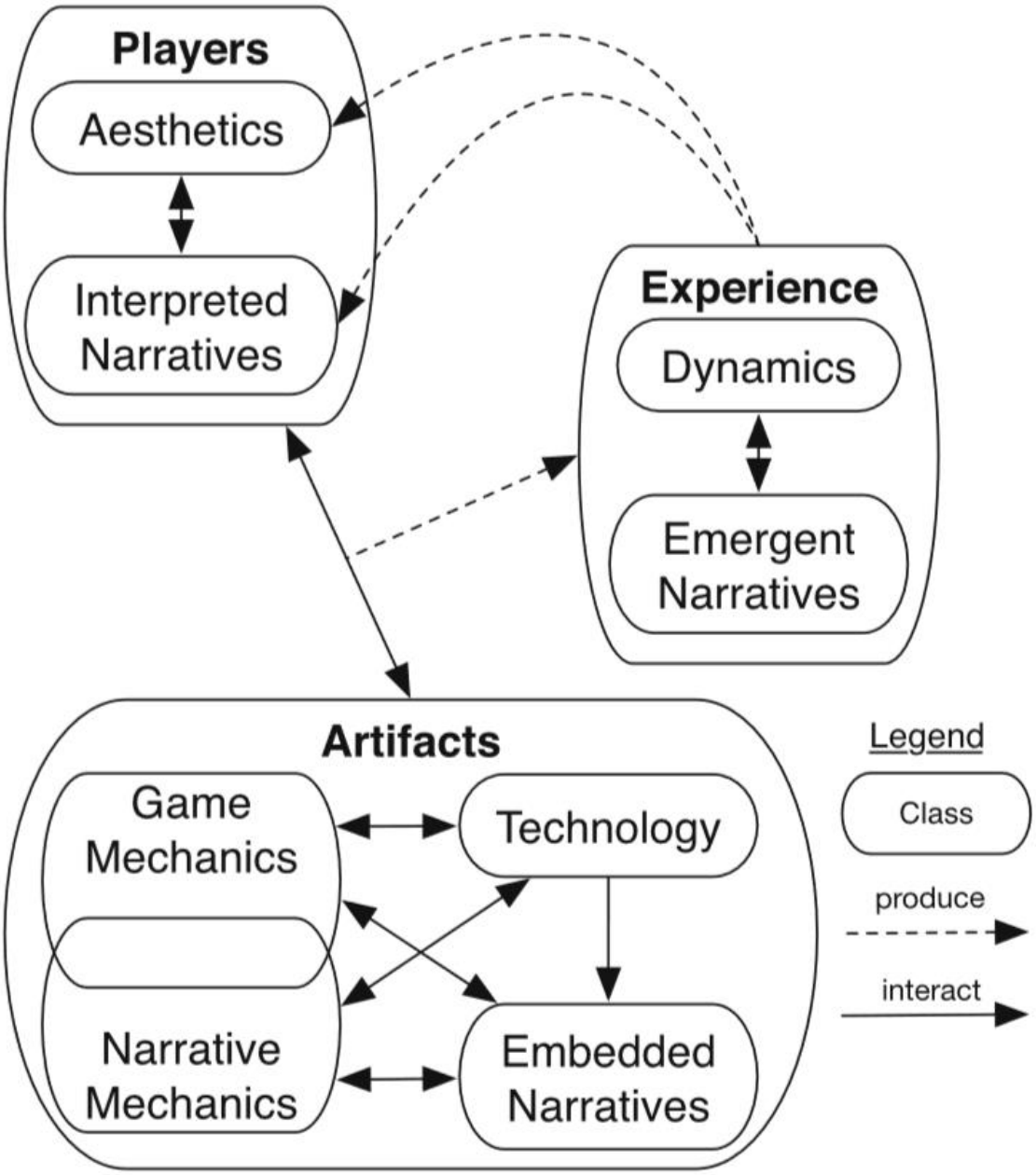


Figure 2.12 - The Unified Theory, from the article "Toward a Unified Theory of Digital Games" by Ralph & Monu (2015).

Our reasoning for bringing this theory into play, is in order to have a framework or a lens of which to shed light onto those parts of game design containing relevance to Environmental Storytelling and implicit communication. We are of the opinion that when looking at video game and narrative design solely from a narratological perspective, it overlooks elements enhancing player immersion into the video game experience. Our focus will be on understanding how to create indirect **Embedded Narratives**, meaning understanding what design choices are needed to convey certain concepts without taking control away from the player. While we expect this will require an understanding of narratology, we also expect this might require us to look at certain techniques used within both film and animation.

Definitions of the Unified Theory

Before proceeding any further, we need to look at the definitions used throughout the Unified Theory (Ralph & Monu, 2015). The authors of the Unified Theory redefined certain terms, in order to make the model more coherent. This prompts us to explore and compare these new definitions to other uses in academic and video game industry literature in order to establish if any redefinition is justified, see figure 2.13.

Term	Definition
Players	Individual, human or non-human agents who use game artifacts to structure play.
Aesthetics	The emotions evoked by a game.
Interpreted Narratives	A player's mental representations and interpretations of a game's intended or emergent narratives.
Experience	Elements related to events, behavior and meaning that emerge from player-artifact interaction.
Dynamics	Emergent behavior of both the game and player during player-game interaction.
Emergent Narratives	A meaningful sequence of events that emerges during player-game interaction.
Artifacts	Elements related to artificial objects and systems used to structure play.
Game Mechanics	Elements used by game developers to create and manipulate challenges for players.
Narrative Mechanics	Elements used by game developers to advance the plot of the game.
Embedded Narratives	Stories told by developers to players through narrative mechanics and gameplay.
Technology	Tangible and intangible artifacts used to deliver game elements or play the game.

Figure 2.13 - Definitions as used in the article "Toward a Unified Theory of Digital Games", adapted from Ralph & Monu (2015).

When exploring the used terms, a few of the re-definitions raise some questions. We are aware of two uses of the term aesthetics in relation to video games; As a description of art-style and visual quality, or as the field of study into player motivation and preference (Bateman, 2014). While the theory references Richard Bartle, it does not seem explore any of the other endeavours into understanding motivations and emotional response. The inclusion of non-human agents as **Players** also raises questions. While we do acknowledge the human player might project attributes onto a non-human agent, see section 1.1 for an example of this, combining these in the same class might be seen as putting the non-human agent on a pedestal. Schell (2008) explains, that while the game as a whole is aware of the state of everything within the game, the specific agent may very well only be aware of small portions of the game world and react to the best of its ability with its constraints. We see the potential in the Unified Theory as a tool to shed light onto our research questions, but we must challenge certain aspects of it. We will be comparing relevant class definitions of the model to other uses within the scientific literature in chapter 3.

2.5 Summary

We have used this chapter to outline our literature approach, where we used the snowball technique in combination with critical reading and writing. Additionally, we explained our usage of a modified Scrum (Pichler, 2010) and KJ (Spool, 2006) method to manage the timeframe for writing our thesis, alongside a project journey “treasure” map for outlining the end goals. With these tools we will be able to turn our focus towards our lens, the Unified Theory by Ralph & Monu (2015), for the rest of the thesis. We will need to validate this as part of our critical writing in the next chapter. Once this is done, we can turn our focus towards implicit communication and Environmental Storytelling.

Chapter 3 Theoretical Framework and Definitions

When studying theoretical frameworks such as the Unified Theory (Ralph & Monu, 2015), it is easy to forget the amount of different disciplines that are required when creating video games: Stories, rules, animation, programming, acting (voice and motion capture), music, sound effects and several other creative facets. E.g. A game designer does not only have to make engaging gameplay, if the narrative is defined before the **Game Mechanics**, the mechanics would have to follow the reasoning of the plot. Furthermore, the design has to be plausible within the technical limitations of the target **Technology**. The level designer has the same considerations when implementing both the narrative and the game rules. Additionally the levels have to be coherent with the visual aesthetics and guide the player towards key elements in the game, such as story development or an objective. Looking at game developer websites, such as Gamasutra, one can see consideration about everything from fun (Jongeneel, 2013; Taylor, 2013; Totten, 2014), Environmental Storytelling (Jongeneel, 2013; Price, 2011; Taylor, 2013; Totten, 2014), mechanic introduction (Jongeneel, 2013; Taylor, 2013) and Guidance (Jongeneel, 2013; Piaskiewicz, 2014; Price, 2011; Taylor, 2013). Meaning those with a theoretical foundation in mechanics and narrative should take things like: Shapes, colours, perspective, perception, composition and culture into consideration when creating a design. Before we begin to consider defining what a game designer should take into consideration in chapter 4, we need to examine the definitions of the Unified Theory (Ralph & Monu, 2015) and compare the definitions of other games researchers and producers. We wish to see how these definitions incorporate the relationship between narrative, gameplay and communication of these to the **Player** and how this shapes the **Experience**. Once this is done, we can explore the possibilities of superimposing the work of others from different fields into the theory.

Ralph and Monu's (2015) proposed Unified Theory of Digital Games, which draws references from the work of Henry Jenkins, Espen Aarseth, Katie Salen & Eric Zimmerman, Jesper Juul and Jesse Schell. In order to better understand the theory and see how we can work towards a better understanding of implicit storytelling, we will examine the work by the previously mentioned authors.

> *"Before we continue, I want to be clear about why we should seek such a definition. Is it so that we know what we mean when we say "game"? No. For the most part, we all know what we are talking about when we say game. It is true that the idea of what game (or any term) means will vary a bit from person to person, but mostly, we all know what a game is. Sometimes, in a discussion, a debate may arise about whether something is "truly a game," forcing the discussion participants to clarify their own personal definition of what a game is, and once that is settled, the discussion moves on...*
>
> *...Some people, mostly academics, do not hold this view. They view the lack of standardized definitions in the world of game design as "a crisis" that is holding back the art form. Usually, the people most concerned about this are the farthest removed from the actual design and development of games."* (Schell, 2008, p. 24)

While Schell (2008) is critical towards academic definitions, we still need to compare some of the definitions used in the Unified Theory (Ralph & Monu, 2015) with the previously mentioned authors. This will be explored alongside other aspects of their work, which can be seen as affecting Environmental Storytelling, Guidance or other elements of implicit communication to the **Player**.

3.1 Exploring Game Narratives

In this section, we will look into the subject of video game narratives as well as the shaping of the **Emergent Narratives** and related **Narrative Mechanics**, combined with comparisons of certain definitions. The purpose of this is to better understand different views on what defines **Emergent Narratives** and how emergence relates to other parts of the Unified Theory (Ralph & Monu, 2015). Jenkins (2004) article on "*Game Design as Narrative Architecture"* will be used as a starting point, followed by literature by Espen Aarseth, Chris Crawford and Jesper Juul, among others. These sources function to help us navigate definitions **Emergent Narrative** and the relation of elements within video game narratives.

3.1.1 Jenkins and Game Design as Narrative Architecture

When people try to look at games through the lens of traditional narrative, aesthetics or film theory, they often overlook the profound differences between the media. Jenkins attempts to describe games as spaces that are ripe with narrative possibilities (Jenkins, 2004). In the following section, we will examine how Jenkins see these spaces, how they differentiate and how they relay information.

Jenkins (2004) find video games to be in a unique position, where it can entirely forego a defined narrative in favour of a focus on expression or the experience itself. He also explains that in some ways it can at times seem to have more in common with dancing or music. Due to this large span of ways video games come to fruition, you cannot, in Jenkins mind, create a "one size fits all"-approach to analysing and understanding this media (Jenkins, 2004). The experience based nature of games means many factors, that have nothing to do with narrative or storytelling, contribute to player immersion (Jenkins, 2004). A manuscript cannot taken from a movie and be turned into a game. Just as turning a book into a play, it requires re-writing and consideration for the new medium that it is translated into (Jenkins, 2004). Analytics of narratives often look at the overall scheme of the stories in question, a self-

contained whole. Jenkins (2004) argue that stories within games often do not have the need to, or should for that matter, be self-contained. Jenkins (2004) defines a number of ways video games can contain stories, which we will be explaining in the following subsections.

Spatial stories and environmental storytelling

Developing games can be seen as creating compelling spaces, drawing parallels to the spatial stories of Jules Verne or J.R.R. Tolkien (Jenkins, 2004). Older Sci-fi movies of the 1980's were sometimes criticised for favouring world building above plot development, but video games can be seen as a media for this sort of spatial storytelling (Jenkins, 2004). Environmental Storytelling in video games creates a foundation for experiencing immersive narratives as these spatial stories can potentially evoke pre-existing narrative associations or embed information in a Mise-en-scene (Jenkins, 2004). See a summary of the usage of Mise-en-scene in a video game setting below.

> **Mise-en-scene**
>
> While there are differences between film and video games, especially in the way the pleasure is drawn from these media, the increased computing power of modern machines has allowed for a larger influence of film techniques to be incorporated into video games. Mise-en-scene is seen in cinema as a set of tools to guide the viewer's attention and help them make sense of the narrative. In a video game Mise-en-scene can be seen as a combination of carefully designed environments and events in order to guide the player. The increase in power has also allowed video games to borrow and adapt the usage of colour and light into gameplay, to both guide players and express intent and emotions.

A summary of Video Game Mise-En-Scene Remediation of Cinematic Codes in Video Games (Koenitz et al., 2013).

Spatial storytelling is often the foundation for RolePlaying Games (RPG) and even more so for the rather broad category “Open World Games”. Open World Games cannot really be described as a genre, but as a sub-genre (E. Adams, 2014). The newer iterations of both the Grand Theft Auto-series (Rockstar North, Rockstar Leeds, & Rockstar Games, 1997-2016), third-person action-adventure shooters, and the Fallout-series (Bethesda Game Studios & Bethesda Softworks, 1997-2016), action-RPG, use Open World as their setting, see the figure 3.1 below. The aforementioned game-series have new narratives for each game, usually following new characters, but it uses the setting as a common denominator. As mentioned, while they both use spatial storytelling, the genres and the approach to storytelling are different. We agree with Jenkins (2004) and his claim that it will most likely require different narrative theories to examine these.

Figure 3.1 - To the left, Grand Theft Auto V (Rockstar North & Rockstar Games, 2016) and to the right, Fallout 4 (Bethesda Game Studios & Bethesda Softworks, 2016), both have large open worlds for the player to explore.

Evocative spaces

By using pre-existing stories to expand experiences of the audience, the story becomes a larger transmedia narrative economy (Jenkins, 2004). This means instead of using video games to re-tell a narrative, the use of the evocative space allows the player to revisit a familiar world and have a new adventure of their own (Jenkins, 2004). In relations to the Unified Theory, the evocative spaces exist outside the three main classes and produce aspects of the **Aesthetics** and **Embedded Narrative** (Ralph & Monu, 2015). The evocative spaces are also interacting with **Game-** and **Narrative Mechanics** by putting expectations and limitations on the production team, see figure 3.2 below.

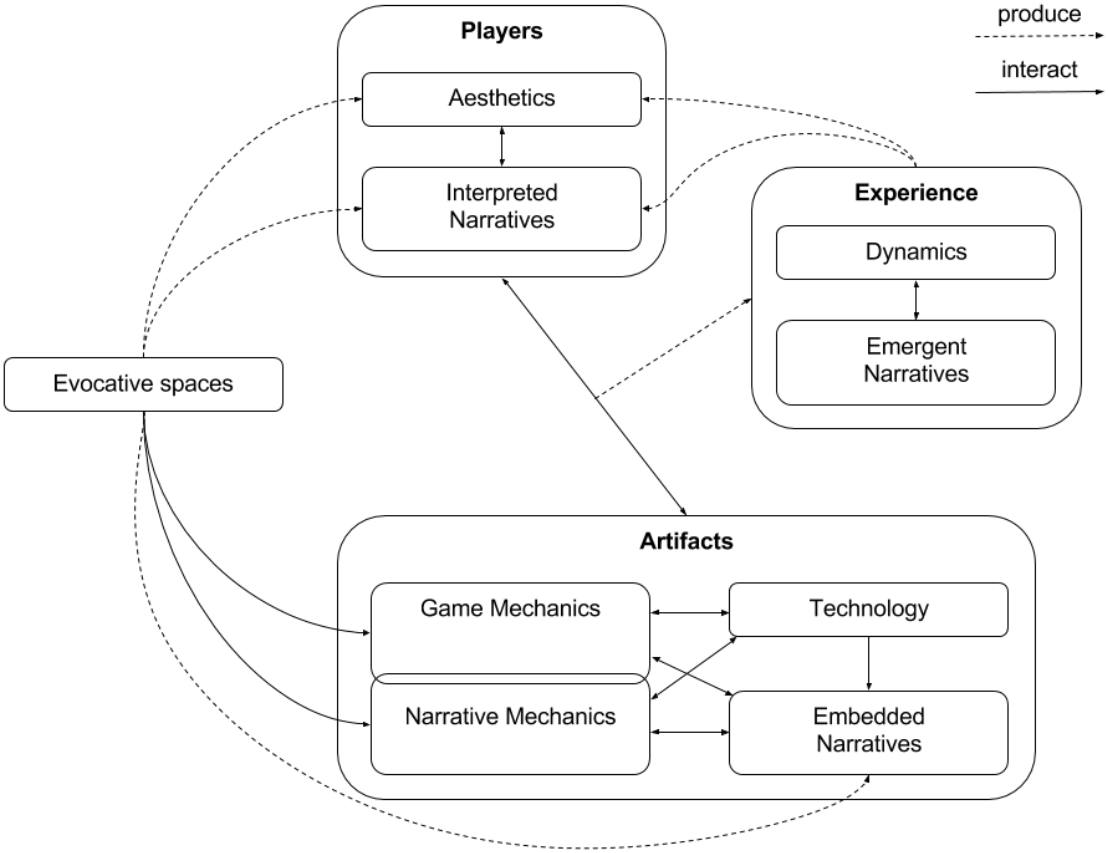


Figure 3.2 - Evocative spaces impact on the Unified Theory by Ralph & Monu (2015).

While it can be argued that the Fallout-series (Bethesda Game Studios & Bethesda Softworks, 1997-2016) use evocative spaces between games, each game is usually presented in a way where the overall narrative is fully capable of standing on its own. A franchise that has used evocative spaces to great extent is Star Wars (Disney, 1977-2016). The old tie-in game Star Wars: X-Wing (LucasArts, Disney, & Interactive Studios, 1993) is an early example of this. E.g. The player participates in the iconic battle between the rebels and the empire above the Death Star see figure 3.3 below.

Figure 3.3 - Screenshot from Star Wars: X-Wing (LucasArts et al., 1993), a fighter battle against two Tie-Fighters above the Death Star.

Enacting stories

Video games are often a series of micronarratives, like a cutscene forming a minor story, this stands in contrast to movies controlled approach to storytelling (Jenkins, 2004). Enacting stories allows the player to be the one performing or witnessing first hand as a story unfolds. However, the level of action in a video game has to be varied. Bombarding the player with action at all times saturates the pleasant experience. Enacting stories can be considered to fall within the overlap between **Game-** and **Narrative Mechanics**, helping the **Artifact** class to produce **Emergent-** and **Interpreted Narratives**, see figure 3.4 below.

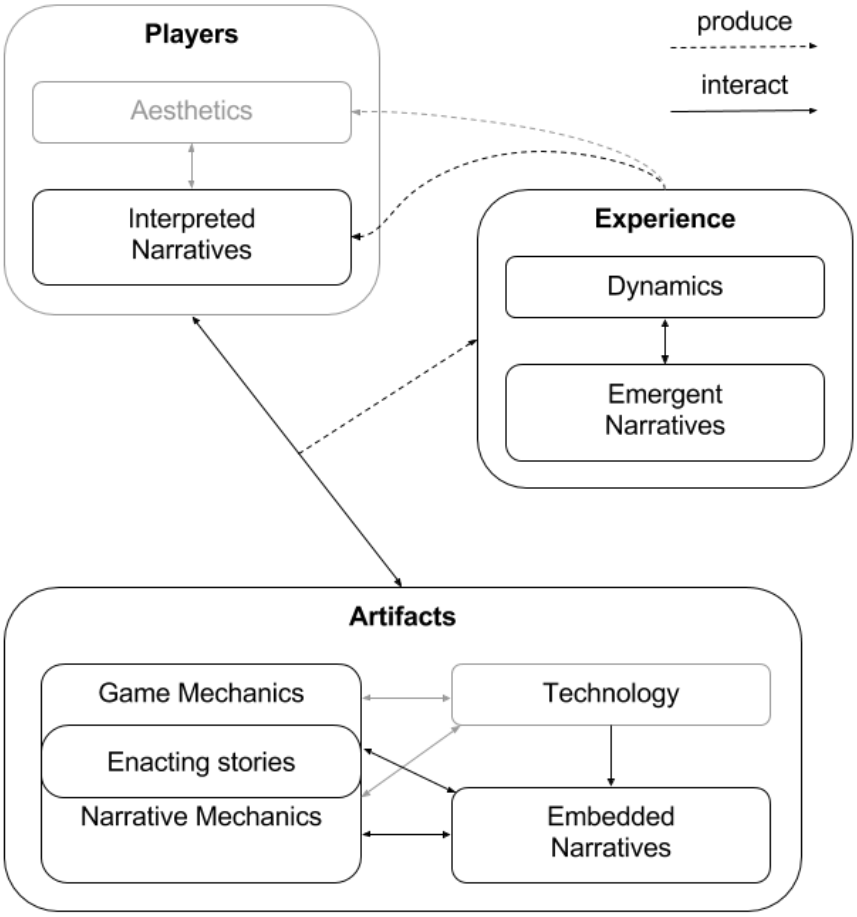


Figure 3.4 - Enacting stories placed within the overlap between Game- and Narrative Mechanics within the Unified Theory (Ralph & Monu, 2015).

Open World Games often use this type of narrative to great extent, usually known to gamers as “questing”. Questing usually revolves around players picking up a number of assignments from Non Player Characters (NPCs) and solving them as they traverse the game world, see figure 3.5 below. They work to expand the spatial narrative of many game worlds, where a quest on its own can form Jenkins (2004) aforementioned micronarratives. Often this is done in conjunction with other quests to form an overarching Embedded Narrative. The Massively Multiplayer Online Role-Playing Game (MMORPG) World of Warcraft (Blizzard Entertainment, 2004-2016) is a prime example of this, using quest-hubs to tell somewhat self-contained narratives for different areas of the game. Other MMORPGs such as Star Wars: The Old Republic (BioWare, Electronic Arts, & LucasArts, 2011-2015), the Guild Wars-series (ArenaNet & NCSOFT, 2005-2015), the games in the Final Fantasy-series with MMORPG elements (Square Enix, 1987-2016) and the Everquest-series (Sony Online Entertainment, 1999-2015) use the same formula. Plenty of single player games also rely on this, from RPGs, such as the Mass Effect-series (BioWare & Electronic Arts, 2007-2012), to action games, such as the Saint’s Row-series (High Voltage Software & Deep Silver, 2006-2015).

Figure 3.5 - Two NPC’s offering quests in Final Fantasy XIV (Square Enix, 2010-2016).

Embedded narratives

An example of embedded narratives could be a video game with two kinds of stories: One is the overall fixed narrative, guiding the player through the video game (Jenkins, 2004). The other is unstructured elements, which allows the player to make their own decisions on how to explore the narrative (Jenkins, 2004).

Now "*would you kindly*" remember BioShock's (2K Boston, 2K Australia, & 2K Games, 2007) **Embedded Narrative** of the power struggle between Andrew Ryan, see figure 3.6 below, and Frank Fontaine. One is the founder of the underwater city called Rapture, which the game takes place in, while the other is a questionable business mogul with a history as a mobster. Throughout the city of Rapture the player finds traces of this struggle, as it has been cast into decay, since citizens were pitted against one another. The experiences of the citizens are revealed as recordings that lay scattered around the city, telling both their personal stories, as well as the fate of the city. The player's perception of the story changes, as the plot twists and sheds new light upon the information that the player has gathered throughout the experience.

Figure 3.6 - A statue of Andrew Ryan in BioShock (2K Boston et al., 2007), the founder of the objectivist underwater city of Rapture.

In the context of the Unified Theory, see figure 3.7 below, **Embedded Narratives** are seen as any narrative told through mechanics and gameplay that is planned by the developer (Ralph & Monu, 2015). This means every narrative tool that is available to the developer in order to convey the story, from cutscenes to gameplay events. This quite broad definition allows for inclusion of storytelling techniques developed or targeted media outside the video games. This seems to fit Jenkins (2004) idea of video games being a sort of transmedia. When looking at this definition in a truly broad scope, an **Embedded Narrative** could be seen as being supported by the work of anyone in the team, from scriptwriters and game designers to animators.

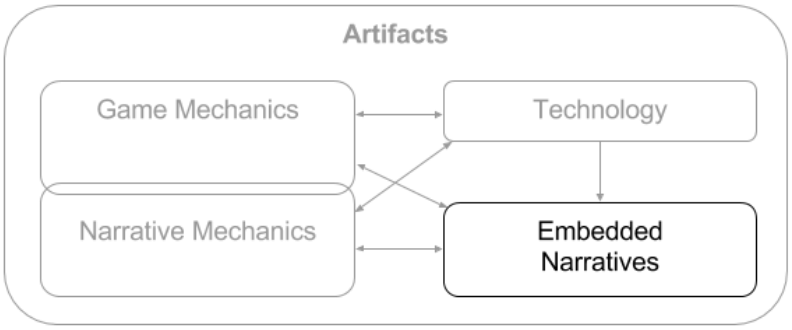


Figure 3.7 - ***Embedded Narratives*** *as part of the* ***Artifact*** *class in the Unified Theory (Ralph & Monu, 2015).*

Emerging narrative

When gameplay itself is what forms the story, it becomes an emerging narrative (Jenkins, 2004). The Sims-series (Maxis, The Sims Studio, & Electronic Arts, 2000-2016) is a perfect representation of this model, the rules of the game pushes the gameplay into a story of the player's character (Jenkins, 2004). Normally this would just be the story of the everyday life of a person or a family, it is the player that imbues it with any kind of meaning. There is freedom within the set rules, so it can be mundane or the player can change the story to the absurd if they so wish, see figure 3.8.

Figure 3.8 - The Sims 4 (The Sims Studio, Maxis, & Electronic Arts, 2014-2016), our Sims are hard at work on writing our virtual thesis.

When we look through the lens of the Unified Theory, it seems to us that Jenkins emerging narrative has been divided into two subsections: The **Emergent-** and the **Interpreted Narrative** (Jenkins, 2004; Ralph & Monu, 2015). The **Experience**, and in turn the **Emergent Narrative**, is a product of the interaction between **Players** and everything **Artifacts** consists of (Ralph & Monu, 2015). The theory seems to take into account that while two players might experience the same **Emergent Narrative**, each **Player** can leave with differently **Interpreted Narratives**. In a local co-op scenario two players might have worked together to achieve their goal, but their interaction with the **Dynamics** of the game and their **Aesthetic** approach might be vastly different (Ralph & Monu, 2015).

Of the different definitions brought forward by Jenkins, two of them can be seen in the Unified Theory (Ralph & Monu, 2015), see figure 3.9 below for comparison. The other definitions are not directly present in the theory, we will take these into consideration during later chapters.

Term	Definition	
	Unified Theory	Jenkins
Interpreted Narrative	A player's mental representations and interpretations of a game's intended or emergent narratives.	The rules of the game world guides the player's character and forms the story that emerges from gameplay rather than narrative.
Emergent Narrative	A meaningful sequence of events that emerges during player-game interaction.	
Embedded Narrative	Stories told by developers to players through narrative mechanics and gameplay.	Narrative structures set by the developer, which in turn is used by the player to create a mental map of the game world.

Figure 3.9 - Comparison between the definitions used in the Unified Theory (Ralph & Monu, 2015) and Jenkins (2004).

The narrative that the player experiences has been split into two groups in the context of the Unified Theory (Ralph & Monu, 2015). Emerging narrative becomes **Emergent-** and **Interpreted Narrative**, a distinction Jenkins (2004) does not make. We read these as being an unbiased and interpreted recounting of the same events. E.g. in the unbiased recounting of events, an alarm sounds and a door opens before the player, while in the interpreted recounting of events, the player associates the alarm with danger and runs to escape through the door. Questions arise in regards to where Jenkins (2004) other Narrative Architectures

are located within the theory. Environmental Storytelling could have been positioned in both the **Aesthetics** and **Embedded Narrative** classes. Evocative spaces may change the **Interpreted Narrative**, but it can be questioned if it is considered **Embedded Narrative**, since the origin of this narrative may exist outside **Artifact** class. Enacting stories seem to fit within the overlap between **Game-** and **Narrative Mechanics**, as it can be seen as a framework of creating both gameplay and story in video games.

One group member was already familiar with Henry Jenkins work on participatory culture (Jenkins, 2007a, 2007b), which worked as a context for his contributions on video game narratives (Jenkins, 2004). Further understanding of Jenkins approach came from his official weblog (Jenkins, 2016), especially his '*about*' page, and examination of the themes of his publications. These publications included work on culture across media and communication. From this, we assume that Henry Jenkins primary interest lies in the social reach of media.

As Jenkins (2004) does not incorporate the overall **Narrative Mechanics** in his article, he mainly focus on the contributions of storytelling and the types that it includes. This means we are unable to understand narratological theory and mechanics by looking at Henry Jenkins work in isolation, but instead we will have to use it in conjunction with other narratologists. We have chosen to start by looking at Espen Aarseth, as well as Chris Crawford who considers himself as more pragmatic.

3.1.2 Aarseth and A Narrative Theory of Games

The follow section will explore Espen Aarseth's views of narrative spaces and his general definitions of the components of narratives. Aarseth (2012) sees much of the criticism from Ludologists to be founded in sloppy work within the narratological research community. He describes the two disciplines as having many overlapping elements, specifically with the definitions of World, Agents, Objects and Events (Aarseth, 2012). These definitions can also be seen as parallels to how we humans perceive the world around us: By association of elements and experiences.

Aarseth (2012) defines four different game types.

1. The linear game
2. The hypertext-like game
3. The "creamy middle" quest game
4. The non-narrative game

The linear game is defined by a fixed kernel and flexible satellites, such as the video game Half-Life (Valve L.L.C, Sierra Studios, & Valve Corporation, 1998). The hypertext-like game, offers choices between kernels and fixed satellites with examples being Myst (Cyan & Brøderbund, 1993) and Dragon's Lair (Advanced Microcomputer Systems & Cinematronics, 1983). The "creamy middle" quest game is described as having choices between kernels and having flexible satellites. This is seen in video games like Star Wars: Knights of the old Republic (BioWare & LucasArts, 2003) or open world games like The Elder Scrolls: Oblivion (Bethesda Game Studios, 2K Games, & Bethesda Softworks, 2006). Lastly, the non-narrative games have no kernel and a flexible discourse. This can be described as pure games, such as Chess or The Sims-franchise (Maxis et al., 2000-2016).

The kernel is the essence of the narrative. If a kernel element is removed then the story will no longer be recognisable. Changing satellites will not impact the essence of the story and the narrative should still be recognisable if changed or removed (Aarseth, 2012).

The previously mentioned four elements, World, Agents, Objects and Events is described as follows (Aarseth, 2012).

- World can be defined as containing two types of space: ludic (the actual traversable ingame space) and extra-ludic (the space outside the accessible area, the player sees or feels it as part of the game, but it is not accessible).
- Agents can be described as bots (no individual identity), shallow (names and individual appearance, little personality) and Deep (Flushed out character, with progression throughout the story).
- Objects are categorised as Static, non-interactable objects, Static usable objects, destructible objects, changeable, creatable, inventible. Objects determine the level of player agency, but greater freedom will not allow for a strong narrative.
- Events can be categorised by kernels and satellites: fully plotted (pure story), dynamic satellites (playable story), dynamic kernels (multipath), no kernel (pure game).

Aarseth (2012) describes that video games on an ontic level can span between a Narrative and a Ludic pole. This gradient can also be seen as going from limited to expansive levels of freedom within the **Emergent Narrative**. However, the extra-ludic spaces might leave the player with an **Interpreted Narrative** feeling as if they were part of a larger ludic world.

The video game medium itself can be hard to define, as it can draw on hugely different media, such as movies, sports, graphic novels and other media (Aarseth, 2012). E.g. In sports one cannot expect to see the same tendencies in rules. A tennis match will obviously not have 11 players on each side of the net, even though 11 players on a team would be the standard for

a soccer match. The Unified Theory tries to solve this problem by defining a video game as an **Artifact**; a combination of objects and systems used to structure play (Ralph & Monu, 2015). This should leave the creators of any video game to define what combination of **Technology**, **Embedded Narratives**, **Game-** and **Narrative Mechanics** will suit their specific production in the best possible manner. Aarseth's (2012) ontic poles seems to be a fine way of analysing how the **Embedded Narratives**, **Game-** and **Narrative Mechanics** work in conjunction to produce different levels of player freedom within **Emergent-** and **Interpreted Narratives**. However, interesting possibilities lie within the extra-ludic space and the **Interpreted Narratives**. Even games described as being towards the extreme of the Ludic pole can inherit a large inaccessible narrative from associations that the player draws from their own reality, adding to an **Emergent Narrative**. Minecraft (Mojang AB & Microsoft Studios, 2011) is described as being on the extreme of the Ludic pole, yet the understanding of the world is drawn from the player's own association. In any situation, the player will affect the **Interpreted Narrative**, not only by their **Aesthetic** categorisation, but also by pre-existing knowledge or associations based on everything from culture to daily life.

Aarseth's (2012) Variable model may help us define the overlap between **Narrative-** and **Game Mechanics**. We seek to gain an understanding of the elements of the game world, specifically how every other variable, Objects, Agents and Events, feed into World. A World can probably be described as a series of locations, containing past Events by Agents and their interactions with Objects, a description closely resembling Jesse Schell's (2008) definition. In the eyes of the **Players**, this World can contain the possibilities of new Events as they interact with currently present Objects and Agents. These new Events may be influenced by the Player's knowledge of previously transpired (extra-ludic) Events. This is something that we will explore further in section 3.1.3, e.g. the subject of narrative descriptors. The **Player's** prior knowledge of a game world is a subject where Aarseth (2012) and Jenkins (2004) overlap, as the knowledge that came to the attention of the **Player** can be described by using Jenkin's terms, spatial, evocative. The degree of freedom the **Player** has can be described using Aarseth's (2012) Ontic pole and ludic/extra-ludic spaces, see figure 3.10.

A spatial and evocative space can, to some degree, exist as ludic space or as a gradient into extra-ludic space. As an example multiple of these definitions may be present in the description of a gameplay scenario: A **Player** experiencing an **Emergent Narrative** by participating in an enacting Story in the evocative and ludic space of a "Battle of Hoth" scenario from the Star Wars-Universe (Disney, 1977-2016). The rest of Star Wars is still present as an extra-ludic evocative space in the **Player**'s **Interpreted Narrative**.

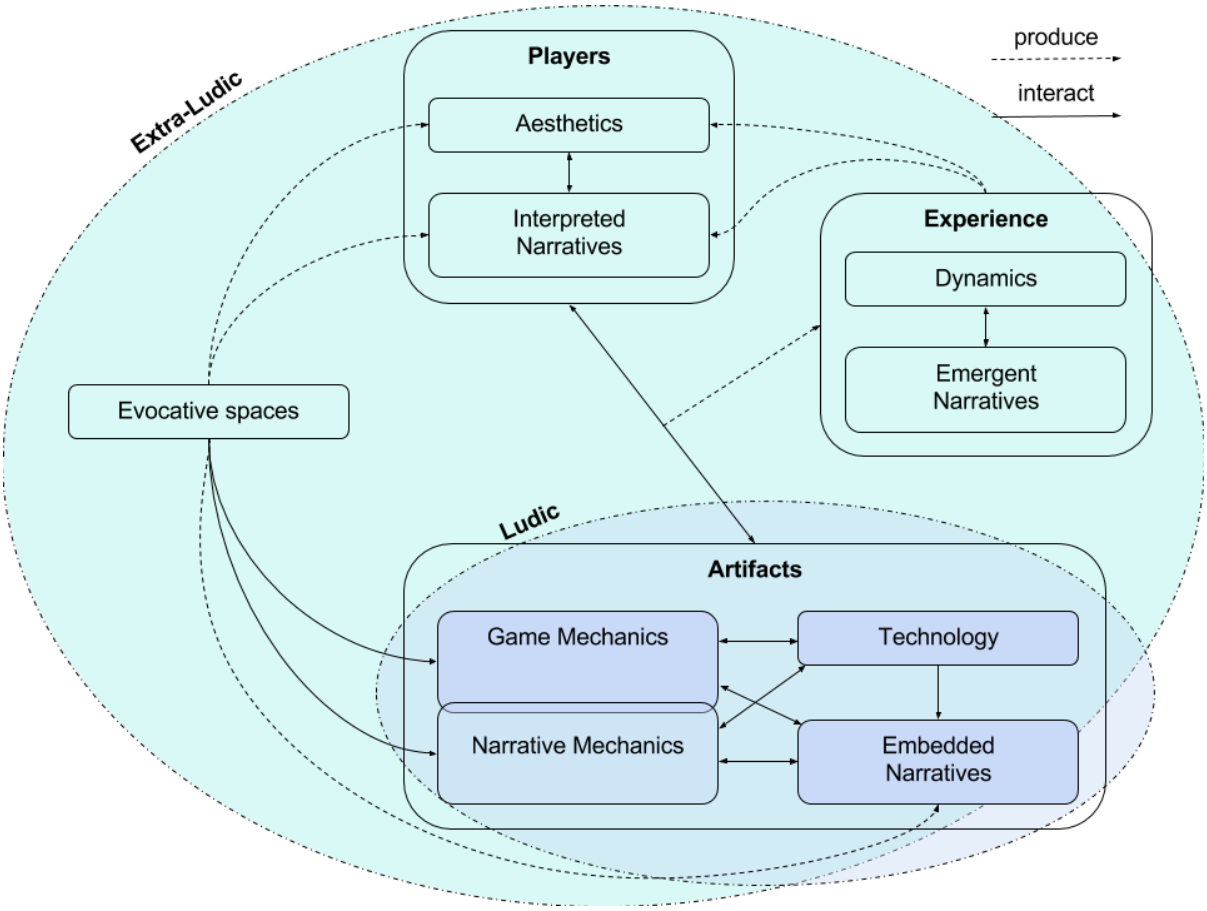


Figure 3.10 - The ludic and extra-ludic (Aarseth, 2012) in the context of the Unified Theory (Ralph & Monu, 2015) and Jenkins (2004).

The player is likely to be guided by their existing knowledge of this world and the associations they have created. In section 3.1.3 we will look into how Salen & Zimmerman have defined elements possessing the abilities for creating such associations, among other things.

3.1.3 Salen & Zimmerman and Games as Narrative Play

Katie Salen & Eric Zimmerman's approach to video game narratives is not to ask if games are stories or how to can craft a better narrative. Instead they concern themselves with the *how* games tell narratives (Salen & Zimmerman, 2004). This *how* is something we need to understand and by looking at Guidance and Environmental Storytelling (or the components thereof), we may understand how these influence the player. It is for this reason we have focused on **Emergent Narratives** throughout this chapter. Salen & Zimmerman (2004) also seem inherit a sense of scepticism towards heavy use of existing theories from other media, as also described by Juul (2005). We will explore Juul's contributions in terms of the book "*half-real"* (Juul, 2005) in section 3.1.5. While Salen & Zimmerman (2004) still draw from past exploration into narratives, they turn the *what constitutes a narrative* into "*how do the elements of a story engender a meaningful experience?"* (Salen & Zimmerman, 2004, p. 378). This approach sees games as tools for crafting narrative experiences, creating meaning through choices and metacommunication. Salen & Zimmerman (2004) identify two main components of game narratives, which are both present in the Unified Theory (Ralph & Monu, 2015) and in Jenkins (2004) Narrative Architecture, see figure 3.11.

<table>
<tr><th>Term</th><th colspan="3">Definition</th></tr>
<tr><td></td><td>Unified Theory</td><td>Jenkins</td><td>Salen & Zimmerman</td></tr>
<tr><td>Interpreted Narrative</td><td>A player’s mental representations and interpretations of a game’s intended or emergent narratives.</td><td rowspan="2">The rules of the game world guides the player's character and forms the story that emerges from gameplay rather than narrative.</td><td rowspan="2">Narrative elements arise during play from the complex system of the game, often in unexpected ways.</td></tr>
<tr><td>Emergent Narrative</td><td>A meaningful sequence of events that emerges during player-game interaction.</td></tr>
<tr><td>Embedded Narrative</td><td>Stories told by developers to players through narrative mechanics and gameplay.</td><td>Narrative structures set by the developer, which in turn is used by the player to create a mental map of the game world.</td><td>Pre-generated narrative content that exists prior to a player’s interaction with the game.</td></tr>
</table>

Figure 3.11 - Comparison of definitions by Ralph & Monu (2015), Jenkins (2004) and Salen & Zimmerman (2004).

Both Jenkins (2004) and Salen & Zimmerman (2004) point to The Sims (Maxis et al., 2000-2016) as one of the most obvious examples of **Emergent Narratives**, but Salen & Zimmerman do not categorise enacting stories as an element in and of itself. Instead they point to it being a combination of **Emergent-** and **Embedded Narrative** (Salen & Zimmerman, 2004). However, Salen & Zimmerman (2004) point to Jenkins when describing video games as narrative spaces and they use Rune Klevjers definitions of fictive worlds and story events to describe this space. While these two definitions draw from both the **Embedded-** and **Emergent Narrative**, they reside within the **Player**’s imaginative engagement. As such they would fall within the **Interpreted Narrative** class if Salen & Zimmerman (2004) had used the Unified Theory (Ralph

& Monu, 2015). A well designed fictive world describes the possibilities and limitations of the game mechanically to the **Player**, while also emphasising the core concepts of the narrative.

Narrative descriptors (Salen & Zimmerman, 2004) are used in order to drive an **Interpreted Narrative**. Narrative descriptors can be found on many levels, in anything from; graphics, animation and sound to the box art or manuals. Ralph & Monu's (2015) usage of the word **Artifact** to describe games, as well as the related technology and delivery of them, is fitting in the context of narrative descriptors. Narrative descriptors seem to exist both outside of the classes, while also being part of both the **Artifact** and the **Player** class, see figure 3.12 for the context of the Unified Theory (Ralph & Monu, 2015). This can be seen in such tendencies as the use of collector's editions within the video game market, as these often expand the experience as described by the definition of narrative descriptors. Collector's editions of games often include extra items like; small statues, art books, maps and more, see figure 3.13.

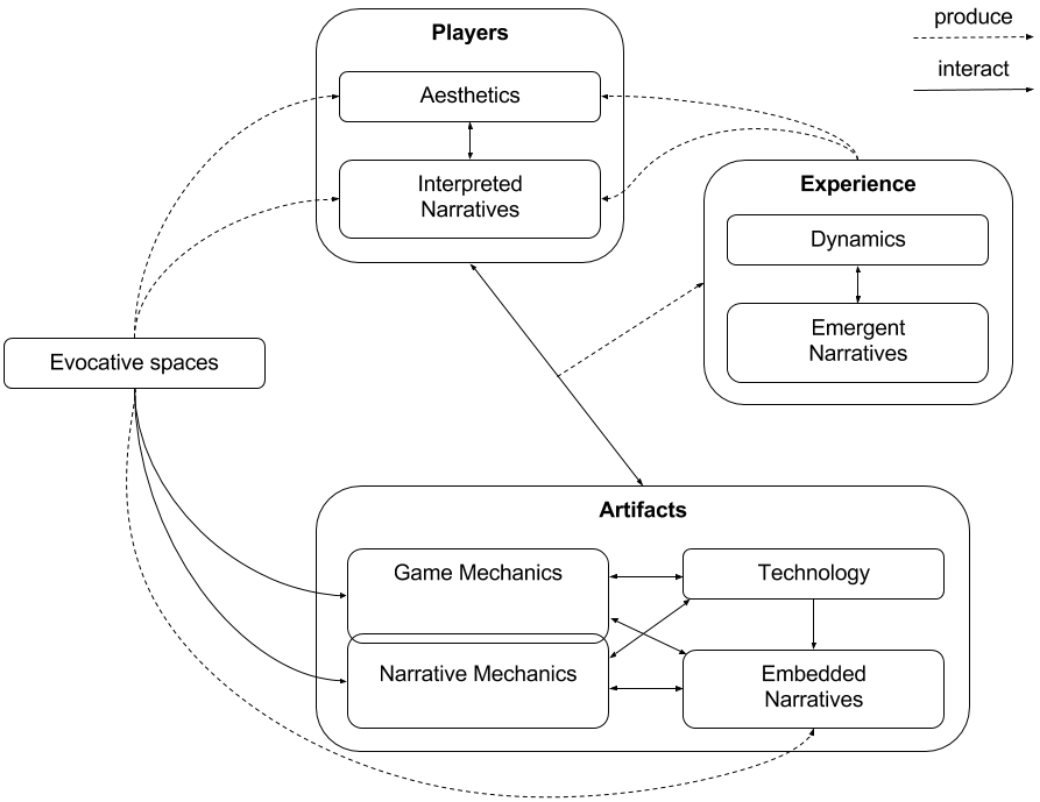


Figure 3.12 - Possible placement of narrative descriptors (Salen & Zimmerman, 2004) within the Unified Theory (Ralph & Monu, 2015) and in relation to evocative spaces (Jenkins, 2004).

Figure 3.13 - Hitman Collector's Edition as displayed on Square Enix website (IO Interactive & Square Enix, 2016).

Narrative descriptors can create a context for the **Player**'s interaction with an **Artifact**, framing the previously mentioned possibilities within the fictive world. If narrative descriptors are well designed, then the **Player** will be able to quickly set their expectation and gain an understanding of the game mechanics and narrative. The original StarCraft (Blizzard Entertainment, 1998) game came with a variety of box art, each with a representative and distinguishable face of one of the three factions within the game. This makes it possible for the player to understand vital plot points about the game's narrative framing, even before looking at the back of the box. The menu screen in Spec Ops: The Line (Yager Development & 2K Games, 2012) shows a view of the game world, which is a disaster stricken Dubai and an upside-down American flag, a distress signal (Cornell University Law School, n.d.), mostly

related to military situations. This way the **Player** has already been given two pieces of very important information before the game has started. Memory works by association, as previously mentioned in section 3.1.2, furthermore the context of the information given can also lead to interpretations (Salen & Zimmerman, 2004). New associations can therefore be created by having well designed narrative descriptors. The game Fez (Polytron Corporation & Trapdoor, 2012) uses a series of symbols as the written language, and by the sheer numbers of different kinds of symbols, the **Player** might assume they correctly represent letters. However, a problem can arise when **Players** with English as a second language attempts to solve the riddle behind the symbols, as it relies on a pangram that might not be familiar to this part of the audience, see figure 3.14 below.

Figure 3.14 - A pangram riddle in Fez (Polytron Corporation & Trapdoor, 2012): "The quick brown fox jumps over the lazy dog"(Salmon, 1888, p. 76). The symbols can be seen on the purple obelisk with fox jumping over the dog to the left of it.

Ralph & Monu (2015) and Salen & Zimmerman (2004) use similar definitions for **Emergent-** and **Embedded Narrative**, as previously shown in figure 3.11. While not using the term **Interpreted Narrative** or **Artifact**, since the Unified Theory was authored 10 years after "*Rules*

of Play" (Salen & Zimmerman, 2004), Salen & Zimmerman offers both tools and definitions on how to guide the understanding of the **Player**. Furthermore, the description of fictive worlds and narrative descriptors help us understand how to emphasise video game **Emergent Narratives**.

3.1.4 Crawford on Interactive Storytelling

We used a quote by Jesse Schell in the introduction of the chapter, outlining his dissatisfaction with academic circles. Crawford found himself in a sort of opposite position: Game developers did not share his views of games containing the possibility to be a strong narrative medium, driving him towards a more academic approach. Most glaring example of this might be John Carmack, developer of Doom, saying "*Story in a game is like a story in a porn movie. It's expected to be there, but it's not that important.*" (Crawford, 2013, p. 52). This was 25 years ago however, and he recognises the industry has changed since. Like Schell, Crawford (2005) does not have a fond view on academic definitions. Nonetheless, he has a definition of interactivity:

> *"A cyclic process between two or more active agents in which each agent alternately listens, thinks, and speaks."* (Crawford, 2005, p. 29)

The term agent in this definition can refer to anything from the person playing the game, an NPC or the computer it is being played on. If used to describe a computer; listen is listening for input from an input device, think is the act of processing data and speak is the act of adapting the game world. The very broadness of the definition makes it seem to fall in line with the views of Schell. But taking things further, Crawford (2005) describes academic work as being incompatible with actual production of an interactive narrative. Yet his definition of interactivity corresponds with both the Unified Theory by Ralph & Monu (2015), where it fits the interaction between the **Player** and **Artifact** class, together with Salen & Zimmerman's (2004), where **Emergent Narratives** is context-dependent on what else happens in the system, see figure 3.15.

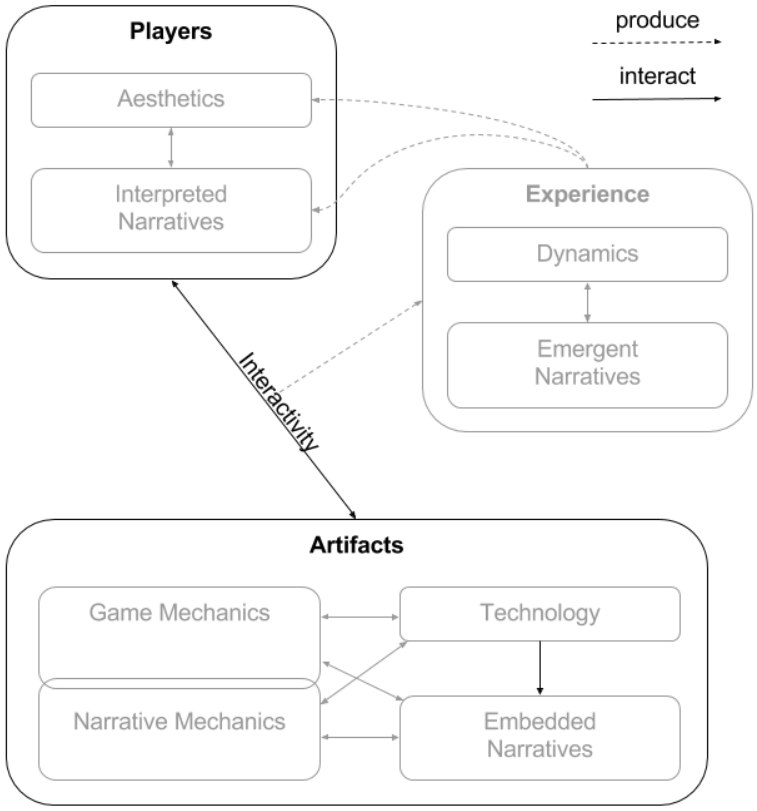


Figure 3.15 - Crawford's (2013) definition of interactivity in the context of the Unified Theory (Ralph & Monu, 2015).

While Crawford's (2005) description of interactivity seems fitting, his use of the word Agent is at odds with the use by Espen Aarseth (2012). Definitions seem to be a recurring problem throughout relevant literature, e.g. Juul (2005) refers to it in his book "*half-real*", see section 3.1.5. We also referred to Jesse Schell in the introduction to this chapter and his dislike for academic definitions, nonetheless we will address the issue further in the partial conclusion.

Crawford ties his understanding of narratives to our perception of the world: Through mental models and associations (Crawford, 2005), as mentioned in section 1.2 and 1.3. This means narratives are also impacted by culture and ways of expression. Humans see patterns, sometimes also where there is none, and we associate based on past experiences (Crawford,

2005). Stories are complex structures and the requirements needed for something to be considered one are hard to define (Crawford, 2005). However, Crawford (2005) defines stories as requiring to be about one specific thing: People. Furthermore, they require conflict, a task or quest to be solved. He sees a story as a collection of stages and find the spatial correlation or the movement between them of little to no importance (Crawford, 2005). Within these stages, the player should be presented with choices, in the order of small choices leading up to infrequent large impactful choices. If the player is presented with large, life or death choices all the time, they lose their emotional impact. Additionally, the choices should be able to change the narrative in such a way, the outcome no longer is optimal. The choices should also be balanced, leaving no obvious answer (Crawford, 2005). Crawford points out the issue often found in video game narratives: While the industry seem to have mastered the interactivity of the **Game Mechanics**, the same level of interactivity cannot be said to be found within the **Narrative Mechanics**.

While we to some degree share Crawford's concern about **Game Mechanics** being prioritised over **Narrative Mechanics**, we are under the impression this is done from an economical perspective: Branching narratives are time consuming to implement and it may very well produce large portions of content, which will only be experienced by a smaller part of the audience.

3.1.5 Juul and the Half-Real

We have used Jesper Juul in section 2.4 in order to have a definition of what constitutes a game. This was used as a starting point as we moved towards the Unified Theory (Ralph & Monu, 2015). In relations to this theory we have focused on the mechanics of the **Artifact** class, one of these included **Emergent Narrative**. This serves as a reason for returning to the work of Jesper Juul, as he has dedicated a large portion of his book to this subject.

Games of emergence

According to Juul (2005), emergence is the most fundamental game structure. Emergence is a way of structuring a game, where it is built on a foundation of rules. This defines a goal of the game, such as defeating an adversary. Furthermore, an emergence game opens for the possibility of different ways to reach the goal through various strategies. E.g. Magic: The Gathering (Wizards of the Coast, 1993-2016) only has one goal, when looking at a standard format, but reaching this goal can be done in multiple ways. One example of this could be winning by making the opponent hit 0 health points, thus killing them. Another way could be to "Mill" the opponent, a way of depleting his cards, which in turn makes him lose the game. Juul (2005) states:

> "*Games of emergence exhibit a basic asymmetry between the relative simplicity of the game rules and the relative complexity of the actual playing of the game"*

(Juul, 2005, p. 73).

Juul (2005) looks into different descriptions of emergence in order to identify different expressions of this phenomenon. One of these is emergent gameplay, where the game is played in a way that the game designer did not predict (Juul, 2005). As Ralph & Monu's (2015) definition is focused towards narratives, **Emergent Narrative**, they do not distinguish between if the emergent behaviour is intended or not by the designer, only that it is meaningful to the player. By the same accord, Juul (2005) lists Systemic level design by Harvey

Smith; game design that allows emergent gameplay (desirable and undesirable). In this context desirable emergence is where the interaction between the different elements of the game leads to interesting gameplay, and undesirable emergence is where players find ways to exploit the rules in ways that make the game less enjoyable (Juul, 2005). These examples show their age, in the video game market with plenty of multiplayer games, where something undesirable by one becomes desirable by another. E.g. Griefing has become a widespread phenomena, where players exploit game mechanics to bring misfortune onto other players. Researchers such as Bartle (2005) who have updated their models for multiplayer games to reflect this. Juul (2005) also explores Mitchell M. Waldrop's definition of emergence, where rules and gameplay are asymmetrical. Emergence games give the player freedom to play a game using different strategies, which Waldrop consider in many ways to be flip sides of the same coin. Lastly, Juul refers to Stephen Wolfram, who uses an analogy from the real world:

> *"Whenever you look at very complicated components systems in physics or biology...you generally find that the basic components and the laws are quite simple; the complexity arises because you have a great many of these simple components interacting simultaneously..."*

by Stephen Wolfram (Juul, 2005, p. 77).

Games of progression

Compared with games of emergence, a game of progression gives the designer much more control over the gameplay, because of the way the game is being structured. In progression, the player is left with a lot less options to win the game, because all events have to be performed in the right order or else the player would lose, drawing parallels to Aarseth's (2012) description of "the linear game", see section 3.1.2. Juul (2005) gives an example of this with the text-based game called Adventure (Crowther, Woods, & CRL, 1976):

"A typical start of Adventure look like this (">" marks what the player types.):

Welcome to Adventure!

…

At End Of Road

You are standing at the end of a read before a small brick building. Around you is a forest. A small steam flows out of the building and down a gully.

>enter building

Inside Building

You are inside a building, a well house for a large spring.

There are some keys on the ground here.

There is tasty food here.

There is a shiny brass lamp nearby.

There is an empty bottle here.

>get lamp

Taken."

(Juul, 2005, p. 72).

Games between Emergence and Progression

Games are often a mix of emergence and progression instead of one of these extremes. E.g. Grand Theft Auto V (Rockstar North & Rockstar Games, 2016) where the player is offered freedom to move around in the game world and undertake different missions. Some missions are unlocked by progression, because the missions are part of a bigger storyline. Additionally there are side missions, which the player can choose to ignore or engage in.

Broad definitions

Juul (2005) mentions how expanding a term, like narrative, can be effective when working with a subject, yet there is a problem in doing so. When broadening a term, it makes the definition cover an expanding number of circumstances and in the end everything could be described by the definition if not carefully used. Below in figure 3.16 we list comparisons of the term narrative, as listed in the book "*half-real*" (Juul, 2005).

Term	Definition		
	Bordwell and Chatman	Brooks	Prince
Narrative	1. Narrative as the presentation of a number of events. This is the original literal meaning of the word storytelling.	2. Narrative as a fixed and predetermined sequence of events.	3. Narrative as a specific type of sequence of events.
Term	Definition		
	Grodal	Jenkins	Schank and Abelson
Narrative	4. Narrative as a specific type of theme-human or anthropomorphic entities.	5. Narrative as any kind of setting or fictional world.	6. Narrative as the way we make sense of the world.

Figure 3.16 - Six definitions of narrative, adapted from Juul's (2005, p. 156) book "half-real".

Emergent narrative

Juul (2005) states that the term emergent narrative is very loosely defined, when it is defined it is as the player's experience of the game. Therefore, emergent narratives is what the player can tell about the game from a play session and how story drives the player experience. As emergent narrative is at the centre of the player's narrative experience derived from gameplay, Jesper Juul uses the previous definitions of narrative, seen in figure 3.16, and analyses how video games encapsulates these descriptions in figure 3.17.

	Novels/movies/general storytelling	*Video games*
1. Narrative as the presentation of event (Storytelling/narration)	Yes	No: Game as activities and rules - games are not just representations of events, they are event. Yes: games as fictional worlds.
2. **Narrative as a fixed and predetermined sequence of events** (story)	Yes	Generally: No. Yes: In progression games as the predetermined sequence that the player has to perform to complete the game, but not as all the failed attempts of the player.
3. **Narrative as a specific type of sequence of events** (story)	Yes	Generally: No. Yes: Progression games can contain this.
4. **Narrative as a specific type of theme** (human or anthropomorphic actors)	Yes	Depends on the fictional world of a game.
5. **Narrative as any kind of general setting or fictional world**	Yes	No: Games as activities and rules. Yes: Games as fictional worlds, with the caveat that games uniquely tend to present incoherent worlds.
6. **Narrative as the way we make sense of the world**	Yes, like everything else in the world	Yes, like everything else in the worlds.

Figure 3.17 - Video games and six definitions of narrative , adapted from Juul's (2005, p. 158) book "half-real".

Juul's definition of emergent narrative already leans more towards Ralph & Monu's (2015) **Interpreted Narrative** definition than Jenkins definition of emergent narrative, see figure 3.18 below. Towards regarding it as a narrative in the normal context of the word, Juul (2005) states:

> *"As long as it* (the narrative) *is not specified, emergent narrative is a nearly meaningless term…"* (Juul, 2005, p. 159).

Juul (2005) has through his descriptions of desirable and undesirable emergence already established that game designers expect their video games to be played in certain ways. While video games often offer such great possibilities, no designer would be able to predict every outcome of emergent gameplay, but an unpredicted gameplay event may not fall outside what the designer would consider desirable. The Sims (Maxis et al., 2000-2016) has been a recurring example of **Emergent Narratives**. There is no way the designers could foresee every outcome, but nonetheless it stands to reason they would consider a large amount of unpredicted outcomes as being desirable.

Term	Definition			
	Unified Theory	Jenkins	Salen & Zimmerman	Juul
Interpreted Narrative	A player's mental representations and interpretations of a game's intended or emergent narratives.	The rules of the game world guides the player's character and forms the story that emerges from gameplay rather than narrative.	Narrative elements arise during play from the complex system of the game, often in unexpected ways.	What the player can tell about the game from a play session and how story drives the player experience
Emergent Narrative	A meaningful sequence of events that emerges during player-game interaction.			

Figure 3.18 - Comparisons of definitions between Ralph & Monu (2015), Jenkins (2004), Salen & Zimmerman (2004) and Juul (2005).

While Juul (2005) points towards unspecified narratives being meaningless, the otherwise unstructured outcome in a game of The Sims (Maxis et al., 2000-2016) could be seen as a series of already specified micronarratives, enabled by carefully designed **Game Mechanics** to the expected approaches by players, see section 3.2 for more on player types and approaches to gameplay. Additionally, a design can aim to teach the player certain gameplay conventions in order to promote certain types of desirable emergence, see section 3.3.4 for examples from Half-Life 2 (Valve Corporation, 2004). This makes it clear that designers have expectations towards what kind of **Emergent Narrative** they expect to unfold within a video game.

Juul's (2005) writing sheds additional light on the problem with definitions within games research, but he does not offer a clear solution towards resolving the issue. In our opinion the problem is not broad definitions, but rather the lack of a clear path from broad to narrow, context specific definitions. Furthermore his own definition of what constitutes a game has issues when concerning some borderline cases, such as traffic, since traffic may include many of the same definitions as skill-based gambling; using pre-negotiated rules, variable outcome (you make it to your destination or you do not make it to your destination), and the rules are fixed. Yet traffic does not have pre-negotiated consequences like gambling does, e.g. you do not decide before going for a drive that you either reach your destination or get involved in an accident. However it is not within our thesis scope to iterate on his model, instead we will draw on the definition of the "Magic Circle" coined by Johan Huizinga (Huizinga, 1992) in 1938 and brought into further prominence by Salen & Zimmerman (2004), which could be seen as solving this inconsistency. The Magic Circle is the idea that the player always knows when they are participating in a game. In our example with traffic, a person would not be playing a game unless that person is participating in a race. "*half-real*" (Juul, 2005) includes a perspective on different types of emergence, from gameplay to narrative. These realisations on desirable and undesirable play, from a designers perspective, raises questions towards whether player type models and theory on emergent- gameplay and narratives could be

brought together to better understand player approach to video game narratives. We have already discussed the ways level designers attempt to guide the player's emergent narratives through guidance and environmental storytelling in the introductions to this chapter, yet Juul does not seem to take such elements into consideration, when discussing how to avoid undesired emergence. In order to further explore this sort of Guidance, we will cover **Aesthetics** in section 3.2. However, before visiting **Aesthetics**, we will need to cover Jesse Schell's contributions towards emergence.

3.1.6 Schell and A Book of Lenses

We have previously quoted Jesse Schell in the introduction to this chapter, specifically his distaste for some of the usage of definitions within academic circles (Schell, 2008). It is Schell's (2008) opinion that a theory of video games does not have to be 100% sound in every case, as long it helps to produce a better video game experience for the specific circumstance of the production (Schell, 2008). Producing this experience requires the developer to clearly communicate what expectations the player should have towards the product, what *need* it will fulfil, e.g. validation of personal skill or socialising (Schell, 2008), see the following section 3.2 for further information on this subject. Fulfilling these expectation requires communication of the rules within the game and giving the player the needed information to make a mental model of the simple game world, compared to the real world (Schell, 2008). This does not mean a developer has to plan or explain every single detail, as players, and humans in general, fill in the blank spaces with information in relation to their own understanding of reality or the expected reality of the game world (Schell, 2008). Crawford also explains this in his description of human understanding in section 3.1.4. It is very much possible to prime these expectations or responses, due the way these models work. Schell (2008) gives the example of cartoon characters, as they only comprise of a series of lines, often not even resembling a human in the strictest of sense, yet still we see them as people. Another example is by making people repeat certain words, which can change the outcome of a response to a simple question (Schell, 2008). Furthermore, people will project their own

abilities and knowledge of problem solving onto the characters they play, just as they will empathise with characters, allowing the video game to project emotions onto them as players (Schell, 2008).

Game space

Schell (2008) also uses the definition of the Magic Circle to define the boundaries of the game. Within this circle exist the game space, even if the game only exist in a sort of "zero-dimensional"-space (Schell, 2008). This means even we do not think of a game occupying any space, it still contains space for the information and conversation required for the game to function. When adding dimensions to a space, it will be filled with meaning and representations of rules and narratives, as every previous author in this chapter states in their own way. In this space the boundaries can be just as important as the space itself, especially in abstract games, e.g. chess or Tic-Tac-Toe (Schell, 2008). Even in 3-dimensional spaces in more technically advanced video games, the actual relationship and sizes of objects do not have to be naturally feasible, as long as they fit a player's interpreted representational model (Schell, 2008). E.g. A dungeon in World of Warcraft (Blizzard Entertainment, 2004-2016) is many times larger on the inside than the outside game world would have the player believe.

Emergent gameplay

Emergent gameplay is somewhat unpredictable, as it can take on a life on its own (Schell, 2008). Sometimes the unpredictability of it means interesting new forms gameplay emerges, which in turn can be developed further (Schell, 2008). By adding more actions that the player can perform, there is a higher possibility for emergence. However, poorly thought out and implemented forms of interaction or an exaggerated amount of possible interactions may just as well hinder player emergence (Schell, 2008). Where Aarseth (2012) placed games on a pole, depending on the amount of interactivity they provided, see section 3.1.2, Schell (2008) points towards the possibility of perceived freedom through careful design. While constraining a player to having a certain number of options might limit their possibilities, it

can also function as an aid and they will still feel like they had a choice. Having unlimited options can seem a daunting task to people (Schell, 2008). A developer can further control the player behaviour by communicating goals. In most cases this will lead the player towards any choice that aids them towards fulfilling a goal (Schell, 2008). These goals can even be implemented in a way where the player feels they have set these goals for themselves. Schell (2008) uses the example of the introduction of a fly that has been etched into the bowls of the urinals at Amsterdam's Schipol Airport, which would make most men aim for the fly. The real goal in this situation was to get men to think of where they were aiming, while at the bathroom and thereby lowering the cleaning costs. In another example, Schell (2008) succeeded in influencing an emergent narrative by drawing the eyes of players towards certain locations in a Virtual Reality experience. This was done by introducing a red line in a position, where the player had free roam to do what they pleased, most players still went to the location, where the designers wanted to advance the narrative.

Driving emergence through empathy

Empathy is yet another way of driving player emergent behaviour, if a developer succeeds in making them care for the fictional characters (Schell, 2008). A caring player will go out of their way to protect or please NPC's. Schell (2008) uses the examples of ICO (Team Ico & Sony Computer Entertainment, 2001), where inactivity prompts evil spirits to attempt to drag the princess away, and Animal Crossing (Nintendo, 2004), where without the player's consent their home decoration is judged by an unseen sinister organisation, the Happy Room Academy, while they are not home. Deus Ex: Human Revolution (Eidos Montreal & Square Enix, 2011) and The Legend of Zelda: A Link to the Past (Nintendo, 1991) both uses empathy to form the player's initial approach to the game world. The main character of Deus Ex: Human Revolution (Eidos Montreal & Square Enix, 2011) has a distrust for human augmentation, but ends up with a majority of his body changed after an accident. This imbues the player with an intended ambiguity towards the subject. In The Legend of Zelda: A Link to the Past (Nintendo, 1991), Link's dying uncle entrust him with continuing his quest to save the Princess and the kingdom. Spec-Ops - The Line (Yager Development & 2K Games, 2012)

uses the interactions between the small squad of soldiers to drive both narrative and gameplay, as the chain of command and the situation they are in explains several features and aspects of the game. Player mood can be further affected by using music fitting of the mind-set the designer wishes to impose on the player (Schell, 2008), both as queues to right or wrong behaviour or as indicator of the amount of energy in the virtual world around the player.

Collusion

The game and the designer is in collusion to guide the player towards having an emergent experience that follows the embedded narrative of the game (Schell, 2008). This means many of the choices an NPC makes might seem like they are in the best self-interest, but they may weigh just as much to do with guiding the player towards a goal or creating a certain narrative opportunity. Schell (2008) uses examples from his own career, with the creation of the Pirates of the Caribbean: Battle for the Buccaneer Gold in Disneyland, and the outside example of the game narrative project Façade (Mateas & Stern, 2005), with algorithms taking narrative tension into account. This subject is however very hard to bring forth examples of, as it would require knowledge of many behind the scene design choices usually not shared with the public.

The excerpts we have taken from Schell and previously from Salen & Zimmerman, see section 3.1.3, both point towards ways of forming the **Emergent Narrative** in a direction of what Juul calls desirable and most likely in accordance with the planned **Embedded Narrative**. Yet players differ in their approach to how they play video games, something we will explore further in the following section on game **Aesthetics** and the BrainHex model (Nacke, Bateman, & Mandryk, 2014).

3.2 Aesthetics

The discussion of **Aesthetics** in games is confusing because the word can be interpreted differently depending on the individual person. **Aesthetics** could mean the use of graphics and sound within a game, as well as the layout of these. **Aesthetics** could also mean the feelings the player experiences or even the feelings the game is supposed to evoke in the player.

Chris Bateman (2014) argues that the confusion of whether or not aesthetics should be used when referring to visuals or feelings, points towards the fact that there is still great uncertainty in the field, even by its practitioners. He goes on to explain that this is not surprising as different types of art are not similar. Bateman (2014) offers the example of dance, theatre, film, painting and sculpture as different types of art. Arguably even with these different art styles the aesthetic of each type would vary much, as there would be a big difference in the initial thought between a painting by Pablo Picasso and a random comic strip artist on the internet. Yet both of them have the same starting principle, as both of them are trying to visualise something by painting or drawing. In the same way, a dance is meant to correlate to a rhythm and by this train of thought, a game is meant to be interactive. Following this definition, participation and interaction might be all that is required to have a "game aesthetic". Bateman (2014) explains that it might be too premature to discuss whether or not investigations into aesthetics have not taken place, as there have been made a great amount of work on player satisfaction modelling in order to measure "fun".

3.2.1 BrainHex

In order to measure "fun" however, it seems natural to touch upon how an individual perceives fun. This comes down to what fun is to the individual person, just like some people might enjoy jazz music and despise pop music, while others are the complete opposite. This is very much the same in regards to video game genres, as some might enjoy puzzles and avoid fighting games. To understand this better we will delve into player types as they are seen in Bateman's BrainHex model (Nacke et al., 2014). The BrainHex model (Nacke et al., 2014) is based on Richard Bartle's player types (Bartle, 1996) and the player type studies that followed, as the original player types were based on players from Multi User Dungeons (MUD) and MMORPGs (Bartle, 1996). Bartle's player types originally involved four different types, but has since been updated and divided into eight types and mapped onto a 3-dimensional model as listed in figure 3.19 below.

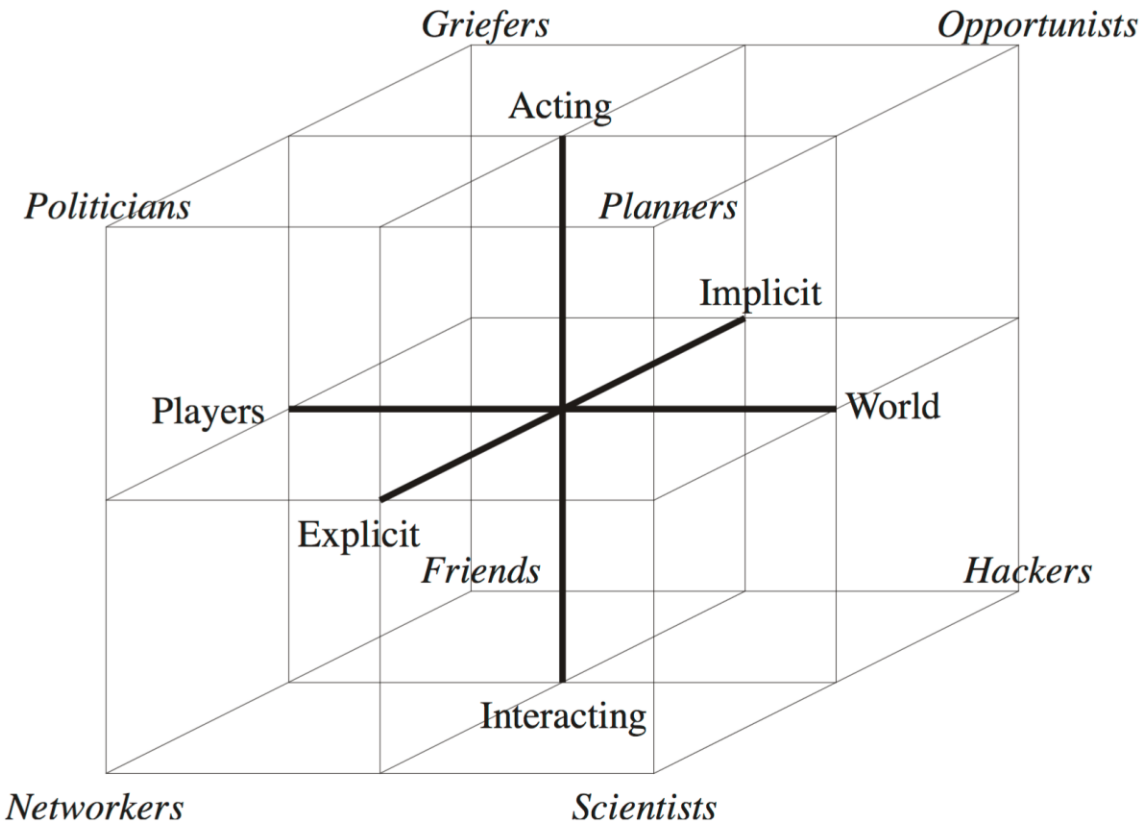


Figure 3.19 - Bartle's 3-dimensional player type model from the article "Virtual Worlds: Why People Play" (Bartle, 2005).

BrainHex has expanded this to seven types, with a considerable amount of subclass combinations (Nacke et al., 2014). These, while in nature covering many of the same behaviours, are based around motivation by preference of stimuli by different reward centres in the brain. The BrainHex model is based on a survey of 50.423 test participants (Nacke et al., 2014). The types are as follows:

Seeker

This type of player enjoys exploration, they seek to stimulate their senses and they will approach a game with a sense of wonder and curiosity. The Seeker will most likely prefer franchises such as Fallout (Bethesda Game Studios & Bethesda Softworks, 1997-2016), Final Fantasy (Square Enix, 1987-2016), The Legend of Zelda (Nintendo & Grezzo, 1986-2015) and The Elder Scrolls (Bethesda Game Studios, ZeniMax Online Studios, & Vir2L Studios, 1994-2015). All of this is linked to a preference for stimuli releasing endomorphin, which is a brain chemical that is associated with a part of the brain that is linked to curiosity and interests (Nacke et al., 2014).

Survivor

Players who deliberately seek thrills from scares and risks, finding the best entertainment in an rapidly oscillating excitement curve, rather than what is more prominently used in Hollywood movies. The Survivor finds these thrills in game genres such as horror franchises like Silent Hill (WayForward Technologies & Konami Digital Entertainment, 1999-2012) and Resident Evil (Capcom, 1996-2016), or action games like Grand Theft Auto (Rockstar North et al., 1997-2015) and Metal Gear Solid (Konami, 1987-2015). These games can stimulate players through adrenaline, enhancing the reward of dopamine (Nacke et al., 2014).

Daredevil

The Daredevils are also a type of thrill seekers. They want thrills that are drawn from speed and excitement in addition to risk taking, so risk/reward instead of the fight or flight of the Survivors. The overlap also presents itself in the choice of franchises, such as Grand Theft Auto (Rockstar North et al., 1997-2015), but then branches towards more action orientated or skill based games, such as shooter franchises like Unreal Tournament (Epic Games, 1999-2016) and Quake (id Software & Bethesda Softworks, 1996-2016) or racing franchises like Need For Speed (Ghost Games & Electronic Arts, 1994-2015) and Carmageddon (Stainless Games, 1997-2015). These games offer the Daredevils the same adrenaline as with the Survivors (Nacke et al., 2014).

Mastermind

Just as the title of the player type implies, these players prefer thinking, efficient decision making and problem solving. But as problem solving is an essential part of video games, these players seek out a broader spectrum of games and franchises, from Chess to The Legend of Zelda (Nintendo & Grezzo, 1986-2015). The Masterminds seek the release of dopamine, linked to both pleasure and decision making (Nacke et al., 2014).

Conqueror

These players enjoy the struggle, whether it involves human opponents or hard fought battles and the eventual victory against computer controlled enemies. The term *fiero* is often used to describe the experience, an intense anger and frustration, culminating in relief once victory is achieved. Players in this category will most likely be playing franchises such as Metroid (Next Level Games & Nintendo, 1986-2015) and Dark Souls (FromSoftware & Namco Bandai Games, 2011-2016), or even entire genres such as MOBAs (Multiplayer Online Battle Arena). Conquerors will seek the release of norepinephrine, which enhances the effects of dopamine (Nacke et al., 2014)

Socialiser

These are the players who enjoy the social aspect of video games, preferring camaraderie and placing trust in their fellow players. The socialisers can be seen as essential elements to building a community around a video game, no matter if it is an MMORPG or a single player experience. They can be seen as the backbones of guilds in World of Warcraft (Blizzard Entertainment, 2004-2016) or groups of players in Left4Dead (Valve South & Valve Corporation, 2008-2015) and Team Fortress 2 (Valve Corporation, 2007-2016). They seek the release of oxytocin that socialising brings, which enhances the effect of dopamine (Nacke et al., 2014).

Achiever

These are the virtual hoarders of video games, collecting every virtual pet and piece of rare gear that a video game offers. They find satisfaction in obsessing over completing lofty and distant goals. They can be seen having caught every Pokémon (Game Freak & The Pokémon Company, 1999-2014), having earned fancy titles in World of Warcraft (Blizzard Entertainment, 2004-2016) or having done obscure side quests in Final Fantasy (Square Enix, 1987-2016). They seek the release of dopamine, which can turn into obsessive behaviour (Nacke et al., 2014).

Each of these player types explain both a preference and approach players may have towards video games. They are not absolutes, as players normally embody more than one type (Nacke et al., 2014), but they can be seen as an explanation to different behaviours unfolding as **Emergent Narratives**. Combined with e.g. Lazzaro's Four Fun Keys (Jacko, 2012), see figure 3.20, these can be useful tools both in shaping choice of **Embedded Narratives**, **Game-** and **Narrative Mechanics**, as well as defining a target audience profile. The combinations of BrainHex classes are divided into 42 subclasses, such as Conqueror-Mastermind, the most common with 8,6% of participants, to Achiever-Survivor, with the least of only 0,4%.

However, as players usually inhabit parts of most classes, they also have an exception player type, meaning they will try and avoid games catering to those kinds players. E.g. One of the authors of this thesis falls under the Seeker-Conqueror with Survivor as exception, meaning he finds no pleasure in horror games.

Fun Key	Emotions	Player Experience
Hard fun	Anger and fiero	Struggle to attain victory, attainment of which is highly rewarding
Easy fun	Wonder, awe, curiosity	Attention maintained by interest rather than by motivation toward winning
Serious fun	Excitement and relief	Engaged with game's core tensions
Social fun	Amusement, schadenfreude	Engaged with game secondary to engagement with other players via game

Figure 3.20 – Adaption of Lazzaro's Four Fun Keys (Jacko, 2012).

Player types can explain why players sometimes intentionally engage in undesirable emergence (Juul, 2005), but this may be done with very different grounds for motivation. Players falling under the Conqueror (Nacke et al., 2014) or Griefer (Bartle, 2005) player types may engage in what the designer deems undesirable emergence in order to provoke schadenfreude as a form of Social fun (Jacko, 2012) by misusing game mechanics. Seekers (Nacke et al., 2014) and Hackers (Bartle, 2005) may attempt to access unintended closed-off areas of the game world as part of their Easy fun (Jacko, 2012). This does not mean that the developer cannot attempt to appease those players, by adding hidden areas and secrets as part of the game design.

While player types can help predict how certain parts of the player-base will interact with a design, they also tell us some of the players will attempt to work against the intended emergence. Jesse Schell (2008) mentioned he was usually happy if 90% of participants behaved as intended by the design. Player types explains why that number will never be 100%, unless directly forcing them and thereby go against what is the essential appeal of video games. In the following section we will explore more concrete examples of how development teams have attempted to guide emergent narratives in video games.

3.3 Game Mechanics, Narrative Mechanics and Guidance

Previously in this chapter we have looked at ways elements of the Unified Theory shape the player experience. In this section, we want to shed light on the overlap between **Game-, Narrative Mechanics** and Guidance in games from a game design literature perspective. We consider these examples to prove previous statements of designers harbouring certain expectations of what desirable emergence will unfold and how they aim to achieve this. Furthermore, it may help us to better understand the grey area between **Game Mechanics** and **Narrative Mechanics** where these overlap. The design aspects mentioned in the introduction of this chapter is scarcely represented in the literature we have uncovered so far, yet they seem to overlap. These three terms are defined as seen below in figure 3.21.

Term	Definition:
Game Mechanics	Elements used by game developers to create and manipulate challenges for players
Narrative Mechanics	Elements used by game developers to advance the plot of the game
Guidance	Clearly communicating possibilities and suggesting a certain action

Figure 3.21 - Definitions directly from Ralph & Monu's (2015) "Toward a Unified Theory of Digital Games" as well as an interpretation of what defines Guidance from Jongeneel (2013).

3.3.1 Game Design Workshop

At a Game Developers Conference Bill Fulton, a User-Testing Manager at Microsoft talked about fun in relations to video games (Fullerton, 2014). As a part of this he also mentioned the use of Guidance in Halo: Combat Evolved (Bungie & Microsoft Game Studios, 2001), where a tutorial level was built so that players would have to explore on their own to find the place where they needed to go. This left players confused, as events would happen like half-open doors in front of them that never opened. Later they resolved this by guiding the player away by having the door explode and force the player to look for an alternative exit (Fullerton, 2014).

3.3.2 Adams and Fundamentals of Game Design

Compared to Salen & Zimmerman, much of E. Adams (2014) book goes into practical advice when designing games. In relations to realising a game world, Adams has the following to say:

> *"...Your game world must support and work with the core mechanics and gameplay of your game. To make the world serve the game well, you must design it carefully. Otherwise you may forget to address an important issue until late in the development process, when it's expensive to make changes."* (E. Adams, 2014, Chapter 8)

E. Adams (2014) lists a number of methods to ensure a pleasant experience for the player, such as using landmarks to insure they are aware of their spatial position or colour to impose certain moods. Teaching players about mechanics in video games is called tutorials, these come in two varieties: Explicit and implicit (E. Adams, 2014). Explicit tutorial are removed from the main narrative of the games, but there can exist somewhat borderline cases, e.g. Call of Duty: Modern Warfare (Infinity Ward & Activision, 2007). In this game, the tutorial comprises of an army training course that has to be completed, as players find themselves as the newest recruit of an S.A.S company and their squad mates want to measure them up.

However, the player can skip the part and just pick a difficulty level. E. Adams (2014) stresses that it is a bad idea to introduce all features and mechanics of a game at once.

3.3.3 Case Study of Explicit Tutorials in Unreal Tournament

Unreal Tournament's pre-alpha version by Epic Games (2014-2016) is a great example of an explicit tutorial happening outside the main game. The tutorial in Unreal Tournament (Epic Games, 2014-2016) is accessed by choosing it from the main menu of the game and therefore not embedded into the main gameplay like in the example from Half-Life 2 (Valve Corporation, 2004), which will be explained later in section 3.3.4. This gives the player the time to explore the mechanics thoroughly as they learn about them in the tutorial. This way the player can decide when they have gotten a feel for the mechanic and want to move on. This kind of tutorial works somewhat like a mini-game, e.g. if we look at figure 3.22 below, we can see a corridor with multiple rooms, one of them is for training with the Shock Rifle, as the hologram with the weapon implies. Inside the rooms player will learn how the mechanics related to each weapon work by completing a series of objectives.

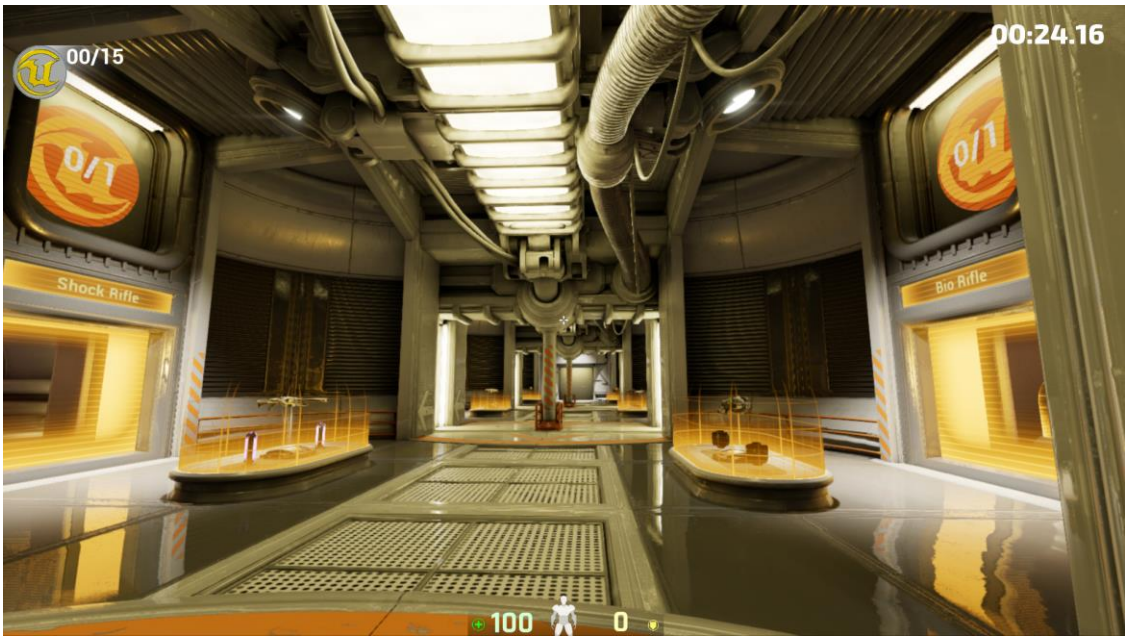


Figure 3.22 - Tutorial hub with rooms for training weapon mechanics in Unreal Tournament (Epic Games, 2014-2016).

In the tutorial menu, when the player has completed a tutorial, they will be able to see their best clear time, see figure 3.23 below. With the inclusion of timers, the player will have a reason to return and see if they can beat their score.

Figure 3.23 - The tutorial section called "PICKUPS" shows the time it took the player to complete it, Unreal Tournament (Epic Games, 2014-2016).

By having an explicit tutorial, it becomes easier for the player to return to a game, as they can reacquaint themselves with specific mechanics. While in the implicit tutorial, it is built into the story and therefore the player may have trouble getting to a tutorial that is introduced several hours into a game.

3.3.4 Case Study of Implicit tutorials in Half-Life 2

Half-Life 2 (Valve Corporation, 2004) is an great example of implicit and naturally feeling tutorial gameplay. Many times tutorial events are obscured, leaving the player feeling like they figured out the usage of the mechanics without aid. The game makes full use of spatial storytelling, Mise-en-scene, associations and other elements mentioned previously throughout this chapter.

At the time of release, Half-Life 2 (Valve Corporation, 2004) offered an advanced physics engine, something the game incorporated into many aspects of its gameplay. Only minutes into the game, before the player has any way of fighting, a guard knocks over a soda can and orders the player to clean up the mess. A simple situation, offering several pieces of both narrative and game mechanical information. The player is told physics present themselves somewhat like what is to expect of the real world, giving them a point of reference (E. Adams, 2014) and they can pick up and put down items. The situation clearly shows the distaste and degrading attitude the occupational force has towards the citizenship of the game world, see figure 3.24. The player is also offered opportunity to create vastly different emergent narratives, as they can comply or offer resistance by throwing the can in the face of the guard. The player is never told what solutions are available to them and nothing is presented as the right or wrong choice.

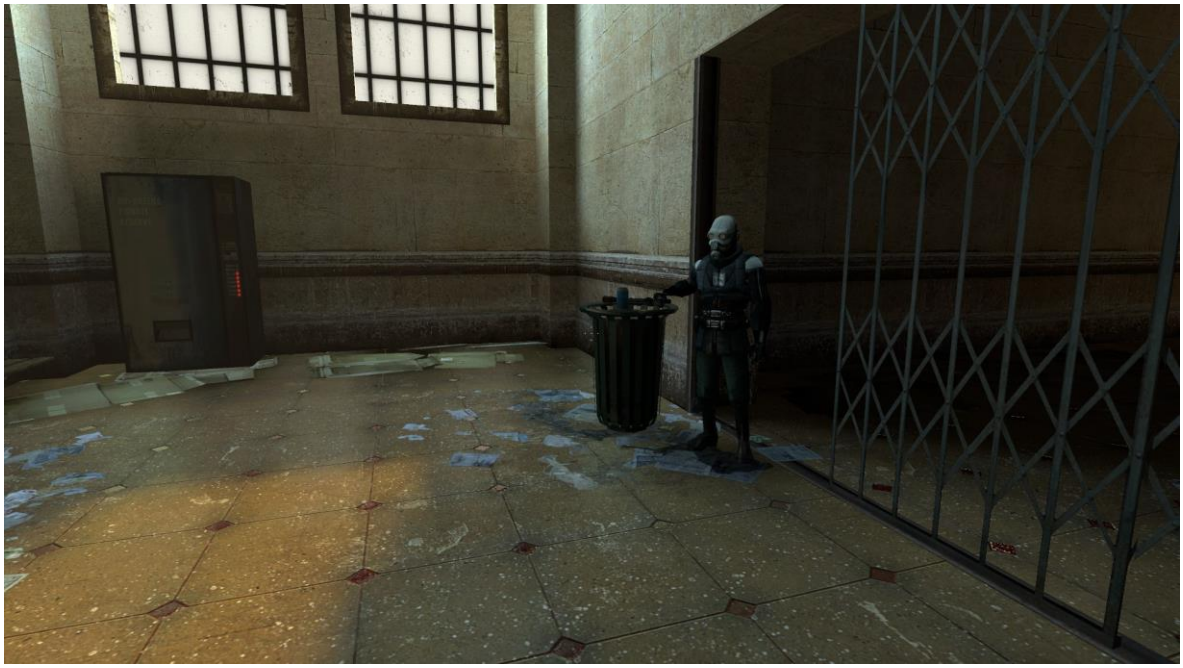


Figure 3.24 - Half-Life 2's (Valve Corporation, 2004) introduction to the occupying force, the Combine.

One of Half-Life 2's (Valve Corporation, 2004) first enemy types is introduced when a crow gets caught in a tentacle coming from the ceiling slowly drags the crow to its death, see figure 3.25. The enemy is a type of alien, called a Barnacle that seems to be stuck to the ceiling, lowering a long tentacle-like tongue that it uses to grab creatures or items to eat. The player is also introduced to several ways of handling this type of enemy. The player accidentally makes the enemy catch an item from the surroundings, showing it does not distinct between what it tries to catch. Later the player is offered this an opportunity to make it catch an explosive barrel, offering yet another way of disposing up to several of this type of enemies at once.

Figure 3.25 - The introduction to the enemy type Barnacles in Half-Life 2 (Valve Corporation, 2004)

This is not the only point in the game where Half-Life 2 (Valve Corporation, 2004) tries to teach the player about enemy types. Early in the game the player meets a character called Dr. Kleiner, who has adopted an alien “Headcrab” as a pet, see figure 3.26. This headcrab lets the player learn about this enemy type by using subtle hints during a narrative scene. The player can observe the movement and possible attacks of the headcrab as it walks and jumps around in the laboratory. Dr. Kleiner even goes as far as to invite his pet onto his head while other characters in the location show disgust. This is mainly because the narrative behind headcrabs is that they can control human beings by placing themselves on the head of a victim and drilling their beaks into the brain.

Figure 3.26 - Dr. Kleiner introduces the player and an NPC to his pet Headcrab in Half-Life 2 (Valve Corporation, 2004).

Sometimes it is not enough for Half-Life 2 (Valve Corporation, 2004) to hint at how mechanics and objects work in the environment as they are too important for the player to avoid. The player will want to keep their health at 100% and collect ammo in order to use weapons. Therefore, the game has crates with supplies scattered throughout the environment. These crates are even labelled supply, but just in case the player misses it, the game places one of these crates in an air duct that the player must climb through as seen in figure 3.27. The player cannot get through the air duct without destroying this crate and will automatically pick up the supplies inside of it when walking through the remains. This prompts a sound effect for health and ammo being picked up. These are sounds that the player will already have encountered when healing at a tutorial health station earlier in the game and should now be associated positively.

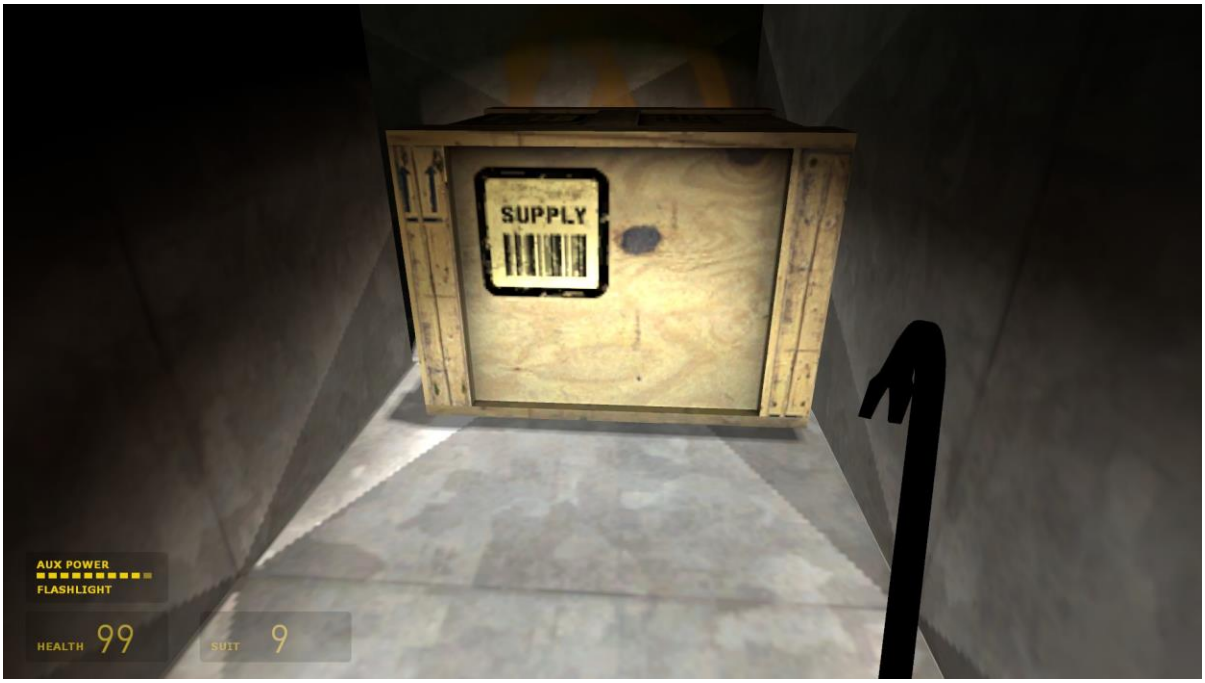


Figure 3.27 - A supply crate blocking the way for the player in Half-Life 2 (Valve Corporation, 2004).

3.4 Suggestion: Emergent Mechanics

Between the different narrative constructs we have explored throughout this chapter, the different definitions of **Emergent Narrative** somewhat reflects a consensus that the gameplay and the following interpretation always have the possibility to extent outside the planned **Embedded Narratives** (Jenkins, 2004; Juul, 2005; Salen & Zimmerman, 2004). What players want from their video game experience can differ extremely, as seen in section 3.2, meaning different players often approach the same games in vastly different ways. Jenkins (2004) definition of the **Embedded Narrative** includes the game aspects, that offer the players an option of choices, paths and decisions they wish to express. Ralph & Monu (2015) on the other hand seem to have relegated some of these design choices enabling such behaviour to the **Game Mechanics** definition. In our brief exploration of **Game Mechanics** and how to communicate these to the player, see section 3.3.4, we are confident that we have shown why such a rigged partitioning of the elements, **Game-** and **Narrative Mechanics**, may not make sense. While the Unified Theory does define these elements as overlapping, we read

this as some mechanics of one element can have secondary attributes of the other element. Therefore, no mechanics are defined as design choices specifically made to bridge the two. This leaves us to suggest a definition for the mechanics that exist in this overlapping space, as they are often created to guide the player both in terms of narrative and in regards to the ludic elements of the game. We suggest naming such mechanics "**Emergent Mechanics**" as we define below:

> ***Emergent Mechanics:*** *Rationalised design choices made in order to promote certain desirable Emergent- and Interpreted Narratives in relations to Game Mechanics and Embedded Narratives.*

Cinema already has a term for the guidance of the viewer's eye and the interpretation of the narrative, Mise-en-scene. While many of the fundamentals of this practise can be somewhat translated to video games, the Guidance of the player can happen on many more levels. We still think Mise-en-scene should be used to define composition of a scene (level) to relay certain information, but it should be categorised as a subcategory of **Emergent Mechanics**. In the introduction of the chapter, we referred to non-academic sources of these **Emergent Mechanics,** overlapping between **Game-** and **Narrative Mechanics**, so it is not something unknown to game developers. Nonetheless, it seems to be absent from the literature we have encountered. Terms such as Guidance, Environmental Storytelling and introduction to mechanics should also be seen as subcategories of **Emergent Mechanics**. While much of this would not exist as essential elements to advancing the narrative plot by Aarseth's (2012) definition, we do consider them to greatly contribute to the immersiveness of a video game experience.

Another aspect we have discussed in relations to the different narrative elements of the Unified Theory is association. None of these elements stand truly isolated inside the theory. E.g. Jenkins (2004) different Narrative Architectures discusses the influence of outside narratives, such as evocative spaces. Aarseth (2012) writes about the extra-ludic aspect of a game, which are narrative elements outside the ingame reach of the player, but nonetheless influential to the player's understanding of the narrative. Salen & Zimmerman (2004) describes narrative descriptors, which are not necessarily confined inside the actual game world. As games often seem to exist as part of a massive transmedia, participatory economy, combined with outside influence of a player's **Interpreted Narratives**, these are of such a complex nature it is well outside the scope of this thesis. In terms of the actual Unified Theory, we assume it might need to recognise what classes interact with outside of the influences in its visualisation. This also means if narrative descriptors were to be visualised in such a way, they can exist both inside and outside the **Artifact** class.

A visualisation of these suggestions can be seen in figure 3.28.

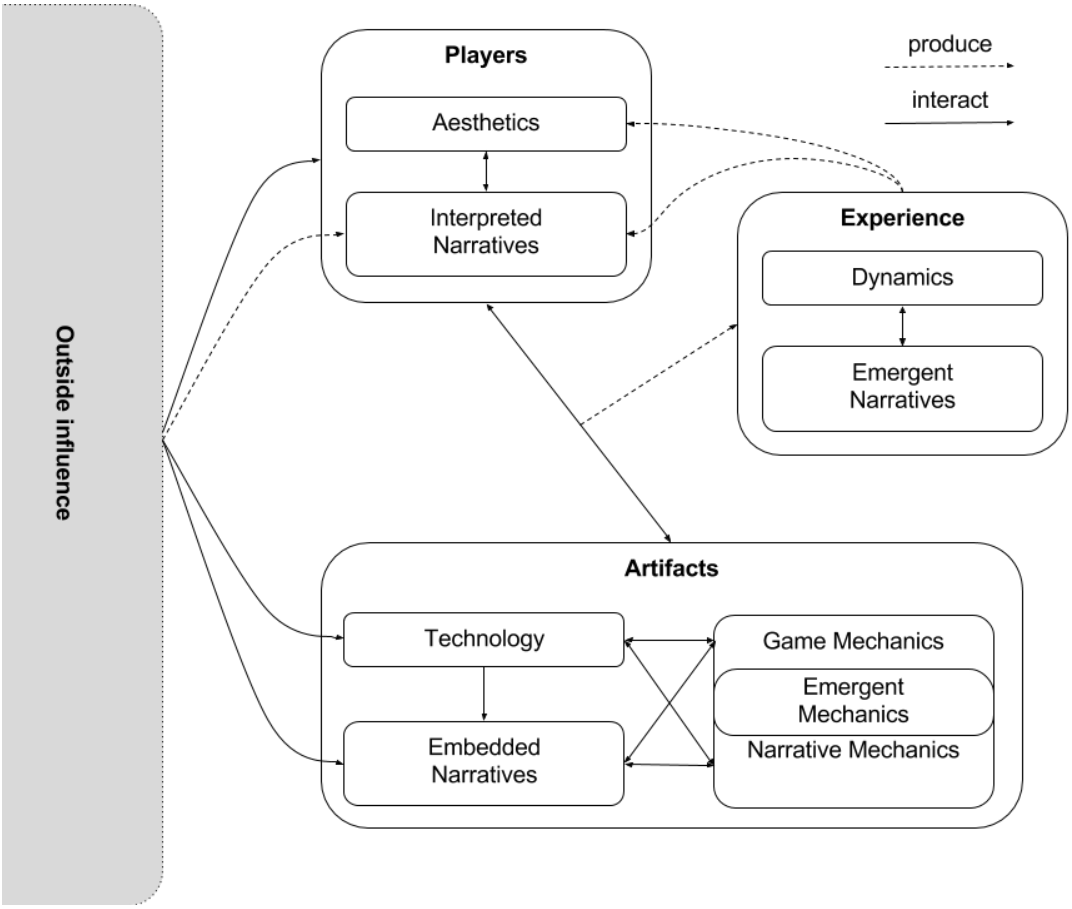


Figure 3.28 - Emergent Mechanics and outside influences in relations to the Unified Theory by Ralph & Monu (2015).

In the model we have included interaction between technology and outside influences. It is outside the scope of this thesis to cover this interaction, but it has been partially included to acknowledge the huge impact outside forces have on video game production. E.g. Previously, the longevity of a game could be expanded by selling "Expansion packs", physical media adding more content to a video game. Today, thanks to the accessibility of the internet, content can be distributed digitally. One of the tendencies this has brought about is smaller content contributions, such as Downloadable Content (DLC) that to some degree replaced Expansion Packs. Another outside influence to the **Technology** aspect of a video game is the current introduction of consumer Virtual Reality to the mass market, by companies such as Sony, Oculus VR and Valve & HTC.

3.5 Summary and partial conclusion

We can see that the definitions of **Embedded-** and **Emergent Narratives** seem to be the same between some authors. However, as mentioned Ralph & Monu has added a third category to accompany these two **Interpreted Narrative**. While this additional category is not used by Salen & Zimmerman or Jenkins, they do acknowledge the importance of interpretations by using **Narrative Mechanics** such as narrative descriptors and fictive worlds. The fictive worlds category used by Salen & Zimmerman (2004) are similar to Jenkins (2004) spatial stories and evocative spaces. The narrative descriptors ability to expand outside the measurable game world can be read as what Aarseth (2012) defines as the extra-ludic, where video games draw from player associations outside the boundaries of the ludic game world. The same understanding of narratives driven by associations can be seen in Crawford's (2005) writing, which in turn makes the interpretation influenced by culture. While a designer can attempt to guide the **Interpreted Narrative**, Juul (2005) points to the fact that players can engage in undesirable emergence, producing **Emergent-** and **Interpreted Narratives** outside the intended design. However, considering the different aspects of what player find desirable, fun or immersive within a video game, such as exploring player types, it should be somewhat predictable what kinds of interactions players may attempt within the confines of the fictional environment. This is where terms we pointed to in our introduction: Guidance, Environmental Storytelling and introduction to mechanics, later including Mise-en-scene, contribute to video game design. We suggested aspects as these should be categorised as **Emergent Mechanics**, as they exist in the overlap between **Game-** and **Narrative Mechanics**. There are most likely plenty of other contributions to game design that can be categorised as belonging to an **Emergent Mechanics** description, as areas such as animation, sound, lighting and the understanding and correlation between different shapes and/or colours.

Definitions

We discussed issues with definitions in section 3.1.5, where we used Jesper Juul's (2005) comparison of the term narrative. We are of the opinion that everyone should attempt to reach the broadest possible definition of a concept before narrowing down by producing a fitting sub-definition for the subject at hand. Crawford's (2005) definition of interactivity is as broad as possible, but using his definition of Agent is incompatible with Aarseth's (2012) definition. Aarseth's (2012) definition allow for the assigning of certain characteristics to an agent, since they are seen in the context of the narrative, but Crawford's (2005) definition is broad enough to go outside of this context. In order to solve this we suggest Aarseth's (2012) definition should be seen as a narrative sub-definition of Agent, see figure 3.29 below.

Agent

⇣

***Narrative* Agent**

⇣ ⇣

***Bot Narrative* Agent** | ***Deep Narrative* Agent**

Figure 3.29 - Suggested ranking of definitions of the term agent, using Aarseth's (2012) descriptors for agents to create further sub-definitions, see section 3.1.2 for further information.

However, we do think the term **Aesthetics** needs to be re-examined and probably be divided into groups based on area of inquiry. Dividing it in such a way that one term can only be read as being related to the visual aspect, while the other term describes player engagement.

Moving forward we to explore the validity of the definition of **Emergent Mechanics** by broadening what we explored in the Half-Life 2 (Valve Corporation, 2004) case study, in section 3.3.4, to other games in combination with everything we gathered on **Emergent**

Narratives. We should in turn not forego analysing what contributions we find the uncovered aspects, animation, sound, lighting and the understanding and correlation between different shapes and/or colours. This should be done to see if they fit our **Emergent Narrative** during new cases and make us aware of other types of behaviour modification. Should such findings come to our attention, it could work as a stepping-stone to further investigate literature on these subjects.

Chapter 4 Emergent Mechanics

The only use of the term **Emergent Mechanics** that we have been able to find in the included literature is by Ernest Adams & Joris Dormans (2012). He used the example of The Legend of Zelda (Nintendo & Grezzo, 1986-2015) games to describe it, where enemies are vulnerable to different kinds of weapons. This encourages the player to change combat strategy depending on the enemies and circumstances in order to get an advantage in battle. Towards the end of the previous chapter, we showed examples of how Half-Life 2 (Valve Corporation, 2004) used a series of implicit tutorials to introduce players to strategies, behaviours and aspects of the **Embedded Narrative** in regards to the game world. In the introduction to the previous chapter, we referred to a series of articles from Gamasutra (Jongeneel, 2013; Piaskiewicz, 2014; Price, 2011; Taylor, 2013; Totten, 2014), all related to forming the player experience or encouraging certain behaviours. We have attempted to create a broad overview of the elements, including those from the previously mentioned blog posts that we understand to have some influence in both player behaviour and perception in video games. This can be seen as an attempt at gathering numerous and diverse fields, techniques and approaches of art and communication under the umbrella of **Emergent Mechanics**. Hopefully, these elements will be scientifically validated by researchers, as tools to communicate narratives and mechanics, as well as the shaping of player behaviour, and by doing so confirming that it should have a category of its own.

4.1 Interactivity and Increased Emergence

Crawford (2005) defined interactivity as being a cycle between two Agents listening, thinking and responding to one another. Increasing the amount of actions the game (**Artifacts**-class) responds to, will in turn increase the amount of actions the player will attempt in a gameplay setting (Koenitz et al., 2013). This notion had already been established in game design literature (E. Adams & Dormans, 2012), where e.g. the video game Metroid (Next Level Games & Nintendo, 1986-2015) has spawned a subgenre known as Metroidvania that has used this extensively. These video games slowly escalate the amount of challenge the player faces, a dramatic effect often used to drive emergence in video games (E. Adams & Dormans, 2012). It is this form of challenge that is at the heart the previously mentioned Metroidvania genre. So where the RPG genre relies on ever increasing character growth, this genre instead offers a focus on player growth by a desire to increasing their skill at the game. E. Adams & Dormans (2012) also uses The Legend of Zelda (Nintendo & Grezzo, 1986-2015) as an example of emergent gameplay, as players are gradually introduced to more fighting mechanics. This in turn helps them to both navigate the game world and fight enemies, some of which become easier if the player has mastered certain mechanics, while others outright requiring them to win. Grinder-Hansen & Schoenau-Fog's (Koenitz et al., 2013) research confirmed that even in an environment, where adding additional mechanics has little to no impact on what areas of the game world was accessible, the increase of mechanics still prompted the player to increase their level of interaction. Combined with some use of randomness (E. Adams & Dormans, 2012), the game design can be arranged in a way, where the player cannot be 100% sure of the given outcome of a situation, forcing them to improvise and as such ensure variations on the **Emergent Narrative** outcome. However, as seen with Half-Life 2 (Valve Corporation, 2004), see section 3.3.4, a situation can be set up in such a way that the **Emergent Narrative** might seem random at first, but is designed to lure the player to perform certain tasks, see figure 4.1.

Figure 4.1 - A zombie appears when the saw blade is pulled out to clear the way. This way the game plays on intuition to explain the effectiveness of shooting with saw blades, Half-Life 2 (Valve Corporation, 2004).

Grinder-Hansen & Schoenau-Fog (Koenitz et al., 2013) pointed towards how players in their test setup drew interpretations from the environment outside the intended aspects of the inquiry. When players engage in exploration of a spatial game environment, they are actively searching for meaning, even when the game designer did not intend for there to be any. This leads back to the narrative descriptors as described by Salen & Zimmerman (2004) and Jenkins (2004), who sees the game space as being ripe with narrative possibilities. Furthermore, Grinder-Hansen & Schoenau-Fog's (Koenitz et al., 2013) description of test participants interpretation of interaction with the NPC draws parallels to the experience one of this group's members had with a previous project, concerning visibility in video games, as mentioned in the introduction in chapter 1. All this points towards players actively, conscious or otherwise, interpreting every aspect in the game world. It is the development team's job to guide this in order to achieve the desirable emergent gameplay, as described by Juul (2005), in section 3.1.5.

4.2 Mise-en-scene

The term Mise-en-scene comes from the cinematic language, which is why we included a brief explanation in section 3.1.1. Ivan Girina (Koenitz et al., 2013) points towards the video game medium having adapted the technique to fit within this newer framework. In cinema the originally french term is used to describe the careful framing of a scene, including performance, correlation between actors or objects, lighting, choice of colours, costumes and so on (Bordwell & Thompson, 2012). It is the guiding of the audience attention and interpretation. No matter if a scene is set in a stylised or realistic setting, the relationship between objects should draw the focus towards what is important, e.g. this can be done by using lines, colour or motion (Bordwell & Thompson, 2012). Colour can also be used to emphasise characters in the choice of costumes or the style of the costume can be a signifier about the nature of the characters (Bordwell & Thompson, 2012). Lighting is also interpreted by the viewer, further emphasising certain parts of the scene and by doing so supporting the narrative (Bordwell & Thompson, 2012). See figure 4.2 below.

Figure 4.2 - A "Big Daddy" is introduced in a cone of light, his lowered and red glowing helmet indicates his ill intent, BioShock (2K Boston et al., 2007).

In film Mise-en-scene works to guide the spectator's eyes in a given the scene, whereas in video games the technique works towards guiding the actions of the player throughout a level (Koenitz et al., 2013). It still involves staging, lighting and framing a path, but it has to take the player's freedom into account. Designers have shown plenty of proficiency in using Mise-en-scene and deliberate staging when conveying their **Embedded Narratives**, Girina (Koenitz et al., 2013) uses Call of Duty 4: Modern Warfare (Infinity Ward & Activision, 2007) as an example of a pioneer in this area. This game relies heavily on carefully scripted sequences and cinematic techniques in its opening act, clearly showcasing how the increase in computing power has opened up new possibilities for **Narrative Mechanics**. Video game players are already familiar with the associations of cinematic codes for lighting and how these are expected to be interpreted. These cinematic codes have seen successful implementation in video games, such as Alan Wake (Remedy Entertainment & Microsoft Game Studios, 2010), Mass Effect (BioWare & Electronic Arts, 2007-2012), L.A. Noire (Team Bondi & Rockstar Games, 2011) and Uncharted (Naughty Dog & Sony Interactive Entertainment, 2007-2016); (Koenitz et al., 2013). The previously mentioned examples from Half-Life 2 (Valve Corporation, 2004), both in section 3.3.4 and 4.1, can also be seen as carefully crafted Mise-en-scenes.

Mise-en-scene is the very sum of parts regarding the tools a game- or level designer has at their disposal, used in unison to tell **Embedded Narratives** and create **Emergent Narratives**. We need to get an overview of these individual elements, but in order to not propel the scope of the project out of proportions; this can be nothing but a superficial exploration. This includes Form and Colour Interpretation, The Camera, Animation, see section 4.3, 4.4 and 4.5 respectively. Lastly, some aspects of what encompasses the term Mise-en-scene can also be seen in the term Environmental Storytelling, which will be explored further in section 4.6.

4.3 Form and Colour Interpretation

In this section, we want to cover both the form of objects along with the colours that these objects have. This is in order to get a better understanding of how these can be used to help the player when playing a video game. First we take a look at an article written by Chris Solarski (2013) called "*The Aesthetics of Game Art and Game Design*", where he explains about character and environment shapes. Solarski (2013) states that there are three type of shapes; circle, square and triangle, which each create different associations for the player.

- *"**Circle**: innocence, youth, energy, femininity"*
- *"**Square**: maturity, stability, balance, stubbornness"*
- *"**Triangle**: aggression, masculinity, force"*

(Solarski, 2013)

Solarski (2013) has made an example of the well known game franchise of Super Mario (Nintendo, 1985-2015). even though the Super Mario games (Nintendo, 1985-2015) have been around for many years, they use form and shapes in the visual design. Looking at figure 4.3, we can see some of the characters from the franchise: Mario, Luigi, Wario, Bowser, and a Goomba (Nintendo, 1985-2015). Mario is built by round and curvy shapes, which give him the attributes of the Circle shape (Solarski, 2013). Luigi has a more elongated figure like a rectangle imbuing him with the attributes from the Square shape (Solarski, 2013). When looking at the enemies in the video games, they have a tendency to be formed like triangles. This can be seen with Wario, Bowser and the Goomba, as the shape gives them a more aggressive look (Solarski, 2013). Solarski states that:

> *"The shape spectrum of emotions should NOT be used as a design formula -- but as a conceptual tool to assess artwork and identify problem areas."*

(Solarski, 2013).

Figure 4.3 - From left to right Mario, Luigi, Wario, Bowser, and a Goomba from the Super Mario-franchise (Nintendo, 1985-2015), Image from Solarski's (2013) Gamasutra article.

Crawford (2005) states, that the human brain is good at pattern recognition in the context of storytelling. If we assume this goes for shapes as well as storytelling, then it is possible to use character shapes as a tool for helping the player understand the video game better. E.g. In the Super Mario-franchise (Nintendo, 1985-2015), as previously mentioned, almost all enemies are shaped like a triangle, in contrast to Mario's round shape. This forms a pattern, which makes it easier for the brain to recognise enemies. Colours can be used to make the same association by using similar colours for certain types of characters in a video game, to distinguish between foe and ally. E.g. In League of Legends (Riot Games, 2009-2016), see figure 4.4, we see that the player's team is depicted with the colour blue, both when it comes to the team's AI and player controlled characters. On the right side of figure 4.4 we see red characters and a red health bar for the enemy. If we look closely, we can see that the character controlled by the player has a yellow health bar, to easily differentiate this player's character from characters that are controlled by others.

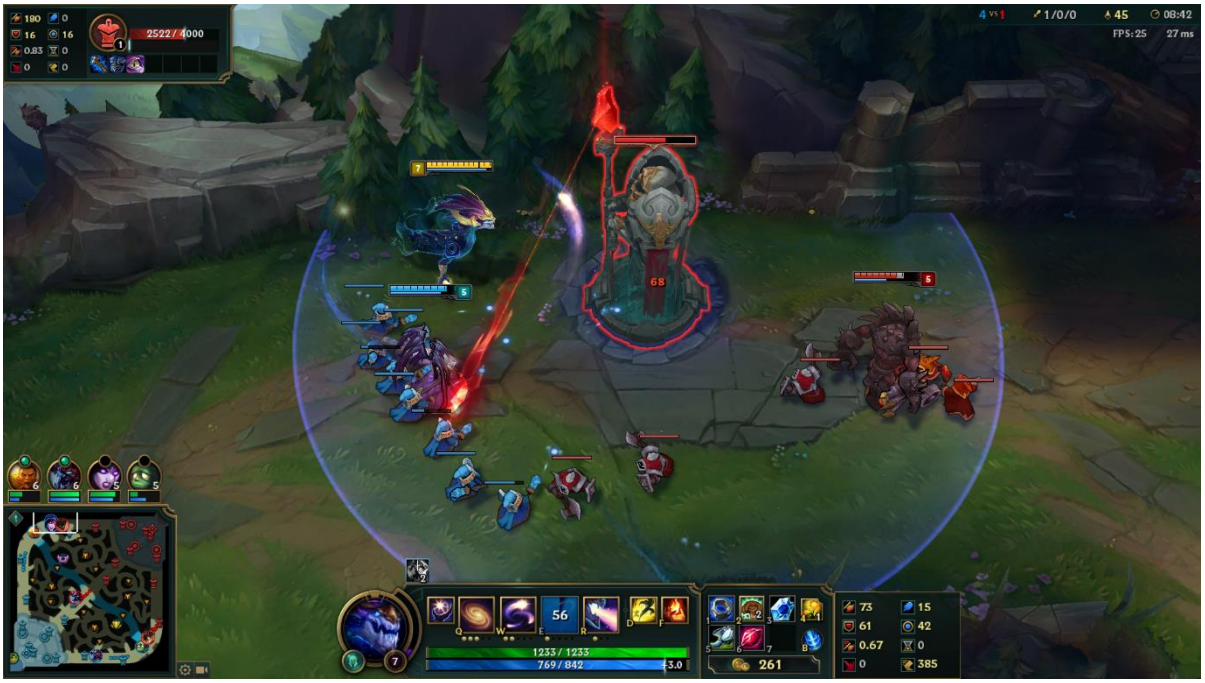


Figure 4.4 - Characters from the blue team trying to destroy a tower belonging to the red team, League of Legends (Riot Games, 2009-2016).

Colours can be used to make associations for the player, in order to make it is easier to recognise friend from foe. This brings up the question about why the allied team is coloured blue. In order to find out more about this we looked into a book called "*Din Farvepsykologi"* by Birgitte Hultberg (2012). In the book she states that each colour has their own meaning and that colours symbolise different things, see figure 4.5.

	Colour:	Meaning:
	White	simplicity, purity, innocence, virginity goodness, trustworthiness, peacefulness hygiene, sterility, cold
	Yellow	joy, happiness, optimism, hope imagination, intellect, philosophy, idealism falseness, betrayal, jealousy
	Orange	energy, lively, movement, joy impulse, creativity, enthusiasm activity, expansivity, change, striving
	Red	vigor, vitality, strength, success, energy, speed, passion, love aggression, violence, hatred
	Green	equity, harmony, peace, balance, self-confidence persistence, development, vision, growth boredom, envy
	Blue	balancing, satisfaction, emotional depth, serenity, logic loyalty, stability, safety, order, efficiency formality, reservation, unemotional
	Purple	spirituality, intuition, enlightenment, sensitivity, understanding elegance, dignity, respect, wisdom decadence, cruelty, arrogance
	Brown	reliability, warmth, friendliness, pragmatic, sensuality physical comfort and safety, family focus, tradition, perseverance physical vulnerability, melancholy, everydayness

	Colour:	Meaning:
	Grey	modesty, dignity, maturity practical sense, muted, restraint, neutrality casual, fear of standing out, self-protection
	Black	clarity, sophistication, exclusivity, sexuality weight, seriousness, depth, formality, authority, effectiveness denial, sacrifice, cold, anger, evil

Figure 4.5 - Colour symbolism from the book "Din Farvepsykologi" (Hultberg, 2012, p. 56-64), translated from Danish to English.

If we take another look at the example from League of Legends (Riot Games, 2009-2016) in figure 4.5 above, then there is three colours to keep track of when playing the game; yellow, blue and red. League of Legends (Riot Games, 2009-2016) is set up in such a way where the player's team's health-bars are always blue and the enemy team's health-bars are red. If we look at the meaning of the colour for the enemy team first, red seems to fit perfectly because it symbolises aggression and violence (Hultberg, 2012). The colour blue for the allies have the meaning loyalty, which fit with the fact that the player should be able to place trust in their team (Hultberg, 2012). Another thing that could be looked into is colour contrast, which can be used to further highlight points of interest, but we will not cover that in this thesis.

4.4 The Camera

Whenever someone watches a movie or look at a picture, they rarely think about the amount of work and planning that goes into each individual shot. A camera angle is never coincidental when looking at professional work within the TV and films industry. We have touched on this in section 4.2 about Mise-en-scene and mentioned how important the scene and the setting of it is. In a video game there is no cameraman operating the camera and deciding what the player is able to see, although certain games such as the original Silent Hill (Konami Computer Entertainment Tokyo & Konami, 1999) would have fixed camera angles that changed depending on the location of the player character. But if we look at a first person game such as Mirror's Edge (DICE & Electronic Arts, 2008) or a game that allows for both first person and third person viewpoints such as The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011) or World of Warcraft (Blizzard Entertainment, 2004-2016), then the player is given control of the camera. The camera may still have limits like in Mirror's Edge (DICE & Electronic Arts, 2008) where the player is forced to play the game from the protagonist's point of view, but the player still decides the direction the protagonist is looking.

The camera plays a very important part in a video game, not just because it decides what the player is allowed to see, but in certain video games it also dictates what the player is allowed to hear. Most often the sounds within a game are heard from the perspective and location of the camera rather than that of the character. This would obviously fit on video games seen in first person, but games such as Journey (Thatgamecompany & Sony Computer Entertainment, 2012), where the player character is viewed from a third person perspective also uses the camera as the source that passes the audio of the video game world to the player. This idea for audio and vision for a player character in a video game may not be intentional from the developer, as this seems to be a standard in the video game industry today. But we can argue that the idea has roots in the movie industry, e.g. in Pulp Fiction (Tarantino, 1996) the camera is often very close to the characters when they are having a conversation. In the diner scene at the very beginning of the movie we see Amanda Plummer and Tim Roth who in this scene plays a couple, talking about robbing the restaurant where

they are located. After a while the camera moves to the centre of the table and switches between looking at each actor. Later on the movie returns to the diner and at this point the camera seems more focused on being located around the character that is being talked to. This can be seen when Tim Roth points a gun at Samuel Jackson and asks him to open a briefcase. As the situation escalates and more characters are brought into the situation, it seems as if the camera has its own personality and gets confused, when it has to focus on more than two people in the scene. Therefore, when there are more than one character in play, the camera tries to fit everyone on the screen until the situation calms down and it returns focus to the two characters that are talking. This can to some extent be compared to the camera in a video game, where the player tries to keep the focus on a conversation while characters get introduced or move around. The camera technique of using a chaotic camera as seen in the Pulp Fiction (Tarantino, 1996) example is a great technique to explain to the viewer that the situation in the scene is chaotic and close to getting out of hand for the characters in the scene.

The possibilities with the camera seem almost endless, as new ways of using a camera to build scenes constantly appear. For this very reason, we cannot call ourselves experts on this topic. What we can do, is to look at examples of video games that take inspiration from movies or even the other way around. To give an example of this we can look at the 3rd person action game Metal Gear Solid (Konami Computer Entertainment Japan & Konami, 1998) in which the player controls an agent called Solid Snake, as Snake is infiltrating a secret Alaskan base. The base houses a mechanical armour capable of launching nukes and Snake must use stealth to find and destroy it, as he is both outmanned and outgunned. This brings us to the example, as the player can make Snake press against walls in order to hide from enemies. When pressed against a wall and moving to the corner of the wall the camera show whatever is around that corner, while still keeping focus on Snake, who can be seen in the side of the screen pressed against the wall. This seems familiar to a camera technique used in the Alfred Hitchcock (1959) movie North by Northwest where Carey Grant is fleeing from a plane. In this scene, Grant can be seen in focus on the right side of the screen while a plane

in the centre of the screen is moving closer to him. This is a camera technique that has been used in most titles in the Metal Gear franchise (Konami, 1987-2015).

4.5 Animation

An important aspect of cinema is the believable conveying of characters and how the acting communicates both motivations and relationships between characters and the tone of the film. There are vast differences between how believable acting performances are perceived. E.g. Eddie Redmayne as Stephen Hawking in The Theory of Everything (Marsh, 2015) and Tommy Wiseau as Johnny in The Room (Wiseau, 2003). There is also a difference between the performances of the same character being played by different actors and how that sets the tone of the film. E.g. Kevin Costner and Cary Elwes both as Robin Hood in Robin Hood: Prince of Thieves (Reynolds, 1991) and Robin Hood: Men in Tights (Brooks, 1993). Besides the general visual style of a video game's **Aesthetics**, the animations can be used to relay the narrative, as well as features of the game world and its inhabitants. Nevertheless, animation has some fundamental differences to acting, which has developed since the early days of cartoons. However, sometimes in the development of video games, the task of doing animation fall on people other than those who are skilled in animation, like programmers, as the process might be seen as implementation of a game mechanic, something we personally experienced during DADIU. Something that set early Disney feature film animation apart from the rest, was attention to “weight” in movement (Williams, 2009). This has resulted in 12 principles to remember in any form of animation created back in the 1930’s (Johnston, 1995), but they are still being taught in books on animation today (Kerlow, 2009). The principles can be seen in figure 4.6.

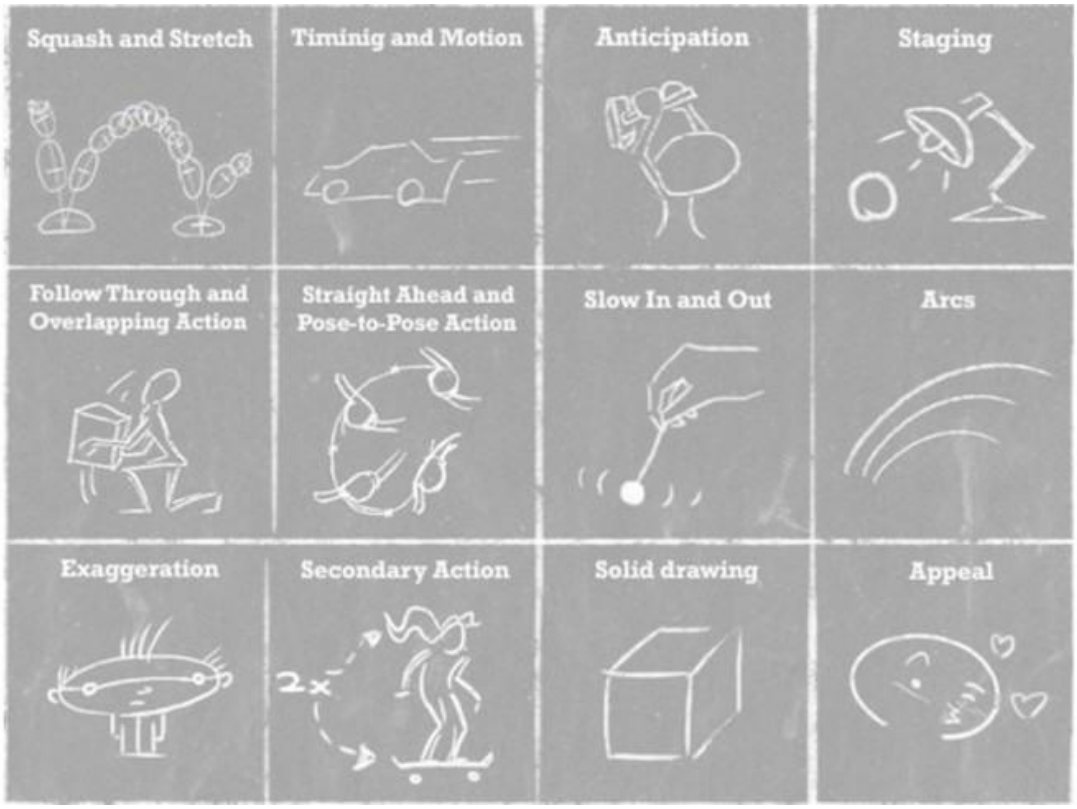


Figure 4.6 - The 12 principles of animation, image from National Film and Television School (n.d.).

Animation communicate to the audience, or in terms of video games the player, a wide range of information about the characters displayed. One of the obvious associations with this is character strength, but another aspect in the "weight" of the movement can relay is the state of mind of characters. The animation should display clear body language depending on characteristics. E.g. A proud person would stand with a straight back, where as a lazy or unmotivated person would look like they were collapsing under their own weight, see figure 4.7.

Figure 4.7 - The character Mei from the game Overwatch (Blizzard Entertainment, 2016), with a list of small details in her animation, she appears shy and slightly nervous, this includes a slight bend forward, shoulders tucked inwards and occasional increased eye movement.

Any type of such animation is usually exaggerated, since people would find it unnatural otherwise. Animation as a whole has this issue and it has been dubbed “The Uncanny Valley” (Williams, 2009), see figure 4.8. When the detail of animation reaches a certain point, where it is very close to looking like real life, it paradoxically begins to look increasingly fake. The issue often lies in the lack of imperfections and mannerisms.

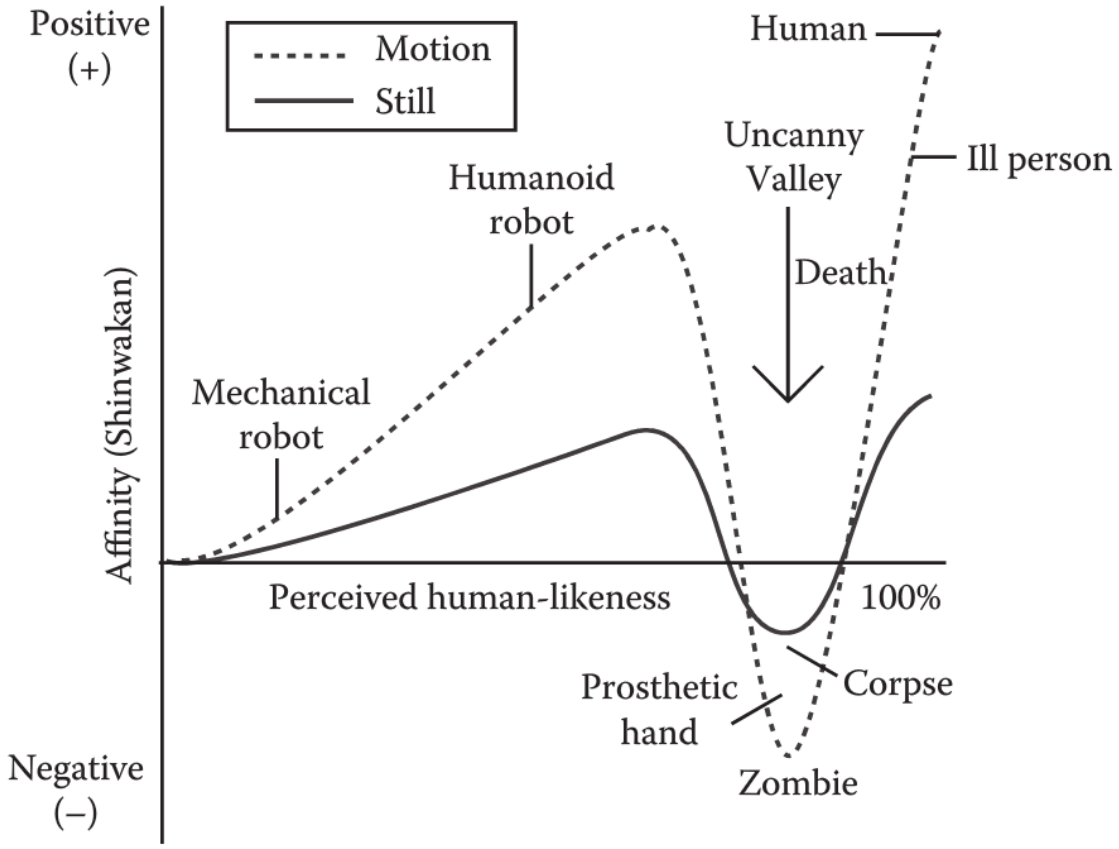


Figure 4.8 - Angela Tinwell explores some of the research and problems related to the concept of The Uncanny Valley, this is an hypothetical graph included in her work from a book by Masahiro Mori (Tinwell, 2015).

Video games often revolve around combat, and as such the animation should ideally include both the previously mentioned more narratively focused information, such as state of mind, but also give the player information about the game mechanics at play. E.g. A strong attack should look like the character attacking puts their weight behind it and the receiver should look as if they were hit hard. But all too often the same animations will play if a character receives a light hit or one that almost kill them, e.g. World of Warcraft (Blizzard Entertainment, 2004-2016). Fighting video games often use a visual trick to make it seem like there is more weight behind attacks by injecting a freeze frame, meaning the game will stop

for a split second. Since the introduction of physics engines in video games, these have been made responsible for some of the animation aspects previously left to animators. See previously mentioned Half Life 2 (Valve Corporation, 2004) in section 3.3.4 for an examples of the implementation of this. While a physics engine usually does a good job of communicating some of the aspects of game mechanics, like the strength or power of characters or weapons, and the previously mentioned animation principles, usually exaggeration. It still exemplifies a simplified and incomplete representation of our reality and as such, it often falls into the same issues as The Uncanny Valley describes in relation to characters.

From our personal experience through the DADIU program, one of the issues with animation in video games is during the production process: It sometimes becomes unclear where one field of development stops and another starts. As such, members of the development team, e.g. programmers or level designers, can sometimes end up implementing features that should have been run past an animator. A computer will only do as it is told, so the development team will need to remember to tell it to deliver a performance in every scenario where acting is required. It is probably easy to forget the entertainment in front of the word software when writing a line of code, even going as far as giving those lines personality.

4.6 Environmental storytelling and Guidance

Previously we mentioned how increasing opportunity for interactivity correlated to the degree that players would attempt to interact and explore their environment, in section 4.1. We have covered how some of the techniques from film, like lighting and lines in the scene, can create what is called Mise-en-scene, in section 4.2. Furthermore, in section 4.4 we explored the role of the camera, while also acknowledging that it is often outside the control of the designer in modern video games. This means leading the eye has been moved from how it usually is in film, where it is done by the director and editor, to the set designers, which are the film equivalent to level designers and environmental artists in video games. They still follow the vision of the director and writers and use the techniques borrowed from film, such as Mise-en-scene, but they are also the architects, city- and event planners of this virtual space. As such, the visual language that is used in video games can go outside that of film. What has been established in video games in a relatively short period of existing, can be seen stretching into psychology, painting (Price, 2011) and architecture (Totten, 2014). Jenkins (2004) already defined video games as being compelling spaces for spatial- and Environmental Storytelling, but in terms of level design, Environmental Storytelling often refers to both storytelling elements as well as design choices made with the sole purpose of guiding the player.

Besides light, direction in the scene itself can be used to direct the player, sometimes obviously, while at other times more covertly (Price, 2011). Towards the more obvious end of the spectrum, signs and arrows can be used to draw player attention. Video games easily allow for such a tool to not seem more out of place than any sign in the real world that is offering direction to a destination nearby. Signs in video games do not have to be obvious to function; an arrow pointing the way can be embedded into scenery. E.g. The level designer and environmental artist have full control over what perceived havoc has taken place before the player arrived and how the rubble of the aftermath is placed. Another option is to make the environment create lines to draw player's attention (Piaskiewicz, 2014; Price, 2011) in the same manner done in Mise-en-scene in movies (Bordwell & Thompson, 2012). The way the

lines themselves are expressed, can be used to communicate certain notions or associations to the player. E.g. straight lines for inorganic, curved and irregular lines for organic or oblique lines for a feeling of change (Price, 2011). Additionally, strategical use of negative space can bring focus to objects, where placing an object in an otherwise empty area draws the player towards it. This can be seen in another often used technique, that can cross between all stages of being a **Game-**, **Emergent-** and **Narrative Mechanic**, as well as being a piece of environmental Guidance, which is referred to as a landmark, monument or weenie (Piaskiewicz, 2014; Price, 2011; Schell, 2008). These offer the player a clear idea of where they are and also often indicate where they need to go. It does this by providing a large, contrasting visual queue in the landscape, see figure 4.9 below.

Figure 4.9 - The Citadel in Half-Life 2 *(Valve Corporation, 2004)*, this enemy stronghold functions as a navigational reference point throughout the game, as well as creating a looming sense of danger and foreshadowing of what is to come *(Jongeneel, 2013)* by usage of vertical lines to emphasise the thread to the fictional world *(Piaskiewicz, 2014; Price, 2011)*.

Another way of level design signage is related to the previously mentioned narrative descriptors (Salen & Zimmerman, 2004), see section 3.1.3. By placing elements, that foreshadow what the player can come to expect from the gameplay in the near future, such as a pool of blood or contrasting destruction of the environment, indicating conflict or someone with ill intention ahead, e.g. from BioShock: Infinite (Irrational Games & 2K Games, 2013) in figure 4.10 below (Byrne, 2005; Jongeneel, 2013). It should be interesting and fun to navigate the game world (Taylor, 2013), which requires all these navigational pointers to work together, clearly communicating and reminding the player of the goal of the game (Byrne, 2005; Jongeneel, 2013; Taylor, 2013). These indicators, or narrative descriptors (Salen & Zimmerman, 2004), should furthermore make the world feel alive and believable (Byrne, 2005) and create an emotional attachment (Jongeneel, 2013; Taylor, 2013).

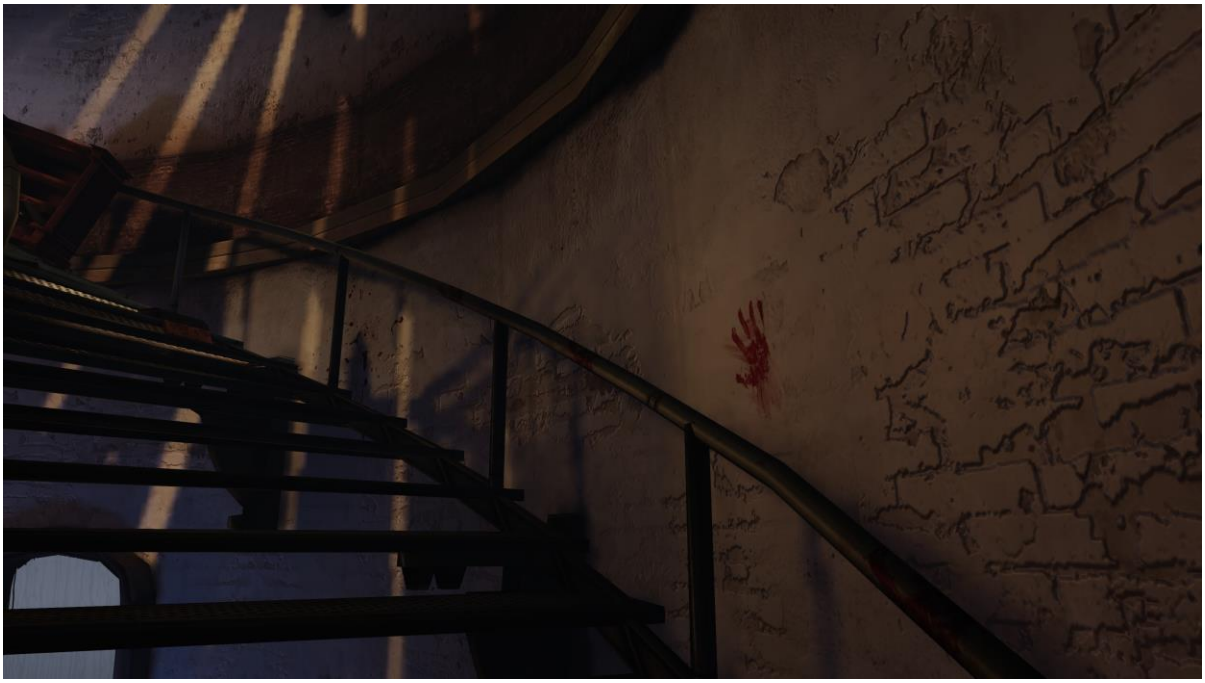


Figure 4.10 - Blood is an often used signal of imminent danger, from BioShock: Infinite (Irrational Games & 2K Games, 2013).

Generally, the borders between what constitutes **Game-**, **Emergent-** and **Narrative Mechanics** are often blurry when it comes to implementing good level design. This is a case of "the whole being more than the sum of its parts". There are of course no saving a game with really poor **Game Mechanics**, but taking a game from good to great requires it all to function well together. Plenty of subtle nudges can in unison make sure the player is not lost or forget their goals, emphasise the narrative, create an emotional attachment and so on. The better the world communicates these elements to the player, the less need there is for taking control away from the player in order to do so, by using cutscenes or forcing the camera. In film it is the leading of the eye, in games it is the leading of the player's whereabouts.

4.7 Uncharted

Uncharted (Naughty Dog & Sony Interactive Entertainment, 2007-2016) is an action adventure game series, where the player takes the role of Nathan Drake, a treasure hunter who seeks out artifacts with the help of a cast of interesting characters. The video game is very story heavy and the narrative is told by a constant stream of dialogue from the main characters, as well as a large amount of cut-scenes. The video game delivers an almost movie-like experience, as the narrative is constantly building and the player rarely encounters a minute without a line from a character or an action-filled encounter. The video game mixes a series of jumping and climbing mechanics with puzzle solving and shooting in a third person perspective. The jumping and climbing seems inspired by the Tomb Raider games (Crystal Dynamics & Square Enix, 1996-2015) and works to build the environments of ancient temples and ruins. The climbing part of Uncharted (Naughty Dog & Sony Interactive Entertainment, 2007-2016) also delivers an entertaining **Game Mechanic**, in that the player may mix it with the gunplay of the video game by hanging on the side of a wall in order to use it as cover while shooting at enemies. The puzzles in the game are often linked with the climbing mechanic as well, where it must be used to reach certain points of a level, in order to activate a piece of a puzzle. Uncharted (Naughty Dog & Sony Interactive Entertainment, 2007-2016) has a large variety of locations throughout the series and every location holds an equally large

amount of scenes, that hold great detail and shape the virtual world. To give an example of this, we can look at Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011), where Nathan Drake is on the trail of the lost city mentioned in the Quran as the Iram of the Pillars, which he believes to be in the Rub' Al Khali desert. In this video game the hunt for the lost city takes Nathan and his friends to London, Cartagena in Columbia, a dense forest in eastern France where they find an abandoned chateau, a citadel in Syria, Yemen and of course the Rub' Al Khali desert. As can be expected these locations have varied scenery from abandoned back streets and pubs in London to a busy marketplace in Yemen. There is a great amount of detail in the game to make all of these areas look as one would expect, such as the pub in London, as seen in figure 4.11, with its posters and signs from various types of beer, pool tables, sports mementos and even a graffiti filled bathroom.

Figure 4.11 - Nathan Drake joins in on the local activities at a pub in London, from Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011).

Chase scene

One of our favourite moments of Guidance in Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011) is a chase scene in a flashback. In this flashback, a young Nathan Drake is being hunted by the antagonist's goons across rooftops in Cartagena after stealing a relic from a museum. We have recorded the chase in order to analyse it in detail, the recording can be found on YouTube (Bendixen, 2016). In this scene, the camera moves mostly on its own while the player is running, to always make sure that the player can see where to go next. Early in the chase, the player encounters a closed door with an open window right above it, as seen in figure 4.12. The window is highlighted by having a bright artificial looking light shine in from the other side, in order to guide the player towards it. To make the window even more obvious, it has a swordfish right next to it working as a sign pointing towards the window, as well as a case with a fire axe pointing up, inviting the player to climb the case in order to reach the window. As Nathan jumps through the window and drops to the ground, the camera shows three walls around him, clearly indicating that there is only one way to run. The camera turns when the player moves towards it, showing a staircase going upstairs. As the player starts to move away from the camera in order to get up the stairs the camera will follow, leading the player through the linear corridor to a fence with a gap in its door, which is big enough for Nathan to squeeze through to get out onto the roofs of the city.

Figure 4.12 - Nathan runs towards a closed door with an open window above it. The environment is here being used to guide the players eyes towards the window, from Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011).

The player quickly finds that more pursuers are waiting for him here, and their positions and the direction, that they are running guides the player to run slightly right in order to avoid them. This leads to a couple of wooden boards that are leaning on a box in order to signal a means of escape, as the player can see a balcony on the other roof with a single lamp highlighting it. After jumping to this location and turning a corner, the player finds another lamp highlighting a new climbable box leading to a chain-link fence. To the right another balcony can be seen, but this time it is highlighted by the building's architecture, as an ornamental balcony wall is guiding the vision of the player up to it. From here, the camera once again turns to show the player where to go, leading to a dumpster, that can be climbed to reach a higher section of the roof. The player will once again see more pursuers, leading the player to move to the right, as the pursuers yell that they are about to start shooting. The player will turn Nathan to a smaller roof, leading around a building, away from pursuers to get out of their line of vision, thus avoiding getting shot. Here the player will find a sequence

of jumps across roof canopies, before once again reaching a roof, where pursuers immediately appear behind Nathan to chase him down. A crate with a blue tarp indicates a jump to the next roof, where a wall will immediately block Nathan. This forces the player to send Nathan to the left, where another box indicates a jump to a new roof. This roof might look like a dead end to those who have not played the game, but the player will notice a yellow coloured line on the window railings, as seen in figure 4.13, which indicates that something is climbable. The player will have seen a large number of climbable objects at this point in the video game and will therefore be familiar with the meaning of yellow colour on climbable objects. Throughout the Uncharted series (Naughty Dog & Sony Interactive Entertainment, 2007-2016) the colour yellow is used to visualise interactive objects or highlight the direction the player is meant to go.

Figure 4.13 - The roof may look like a dead end, but the player will recognise the yellow line in the window, as a visual hint indicating that it is possible to climb here, from Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011).

As Nathan climbs up the wall, it becomes apparent that there is no other way forward than a roof that looks too steep to climb and seems a bit too far away. With pursuers coming from behind and nowhere else to run, the player will attempt the jump anyway and send Nathan into a cutscene, where he quickly loses his grip on the roof and tumbles down, as the player is prompted to press a specific button on the controller. Succeeding at this, will make Nathan jump from the roof through a nearby window. From here the player sends Nathan running through an apartment, as seen in *figure 4.14,* where the camera guides the player by positioning itself, so that the path forward is always known. Nathan may stumble into the owner or furniture as he is running through the apartment. Finally, the player will see an open window on the other side of a bedroom. Jumping out the window leads to a new roof, where the camera shows a friendly character fighting off some of Nathan's pursuers in the background and keeping them from shooting him.

Figure 4.14 - Nathan and his pursuers land in the apartment and an open door to the right clearly marks the way forward, from Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011).

This is a confusing moment for the player, because at first it will look like there may be multiple paths ahead. The border of the play area is yet apparent enough for the player however, that the player will continue to climb up, rather than run around and try jumping to other roofs, as these seem too far away to reach and are blocked by plants. After climbing further up, a lower roof can be seen further on, hinting the player that he might be able to make the jump, even if it seems a bit far. To emphasise this, a metal lamp post is leaning against the wall, indicating that Nathan might be able to swing himself across with it, even if it is not coloured yellow, like many other interactive objects. After swinging across, Nathan lands on a roof window and clear sounds of it starting to crack can be heard, urging the player to hurry Nathan along, before the glass breaks below him. Two pursuers can be seen jumping to the roof behind him at this point, one landing on the glass, breaking it and screaming as he falls through it. The other pursuer can be seen land safely next to the window, as another indication that the player is not safe yet. At the same time, the player will start seeing gunshots coming from the sides of the screen, as he tumbles through a rooftop garden, filled with potted trees and blue tables to indicate to the player that the shooters might have a hard time aiming with the amount of objects blocking their field of vision. At the end of the garden area, the player will be able to see a balcony close enough for Nathan to jump to. The path here seems linear and as Nathan continues running, a pursuer will appear on the narrow balcony in front of him, revealing that it will be impossible to continue that way. The only option is a jump to the left, which from the player's perspective is a leap of faith, as the camera does not show what is in this direction. Knowing that there is a pursuer in front of Nathan as well as behind him, the player will by instinct make the jump, without putting much thought behind the decision. This leads to a cutscene that ends the chase, as the friendly character, who fought against the pursuers earlier in the chase, shows up to save Nathan.

4.8 Summary

In this chapter, we went through different methods of **Emergent Mechanics** that help shape and enhance the video game **Experience**, **Emergent-** and **Interpreted Narrative** of the player in such a way that the player would not realise it. The methods range from the subjective to the more objective and from a narratological or ludological to the more artistic approach. This raises the problem of a shared common language, e.g. Mise-en-scene originates from movies, see section 4.2, and certain Guidance principles springs from architectural knowledge, see section 4.6. Furthermore, section 4.7 covers how many of the techniques have been implemented in the video game Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011), including usage of camera, Environmental Storytelling, architectural guidance and animation. It still leaves many of the methods to require academic validation, to confirm if they individually work as genuine methods of Guidance. Furthermore, while we have shown examples of usage in other video games than Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011), we still need to confirm if these mechanics are more widely spread. This is why we will include a series of small case studies in the following chapter 5. As for additional thoughts on the subject, we are aware some of the methods may be subject to different interpretations, depending on external factors, such as cultural norms, but analysing such impact is outside the scope of this thesis.

Chapter 5 Case Studies to Identify Emergent Mechanics

While we have written a definition for the term **Emergent Mechanics**, we are yet to fully specify what it entails and how it differentiates itself from the **Game-** and **Narrative Mechanics**. If we were to describe the different mechanics with a single word, as seen in figure 5.1, **Narrative Mechanics** would be the intention, **Game Mechanics** would be the motivation and **Emergent Mechanics** would be the communication of the two. While many of the techniques used in **Narrative Mechanics** can be described as being communicative, we would consider it to be like the description of plot and story elements, one being essential, the other optional. In this case, **Emergent Mechanics** could be considered optional to relaying intention behind the **Narrative Mechanics** or the player motivation gained from **Game Mechanics**. Nonetheless, they offer a deeper connection for the player, by better communicating the possibilities and purpose of the game world.

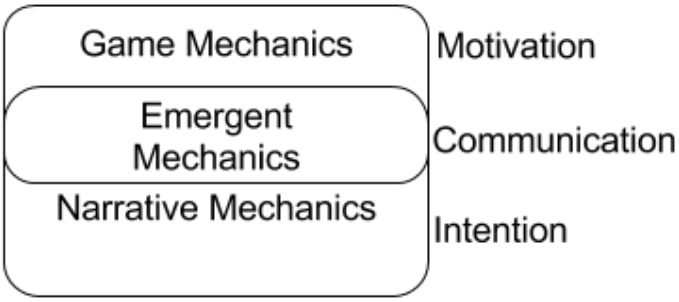


Figure 5.1 - A one-word description of the purpose of the different classes.

With this specification of **Emergent Mechanics** being on the subject of communicating the video game concepts to the player, we have chosen to explore a few video games, while trying to identify the different methods of relaying concepts. This will in turn function as a help at outlining some of the areas that could fall into the **Emergent Mechanics** description. We will focus mainly on the communication done indirectly, meaning without taking control away from the player or communicating through text or audio. This means we will look towards

Guidance and storytelling embedded in the environment or what plays out as part of the gameplay experience.

Some of the techniques we expect to see while gathering empirical data would be methods we as students are familiar with through our education, specifically drawn from film and TV production. However, we will refrain from introducing not previously mentioned literature in this thesis.

5.1 Limbo

In Limbo (Playdead & Microsoft Studios, 2010), the player controls a boy in a greyscale universe, where the player has to solve small puzzles to progress in the video game. After each puzzle, the game is saved, so even if the player dies, they would not have to start all over. In Limbo, there is no text nor speech to communicate to the player, so instead communication is achieved by the help of sounds, music, art style and graphic effects.

5.1.1 Identifying Emergent Mechanics in Limbo

In Limbo (Playdead & Microsoft Studios, 2010) most of the **Emergent Mechanics** described in chapter 4 are not used. Colours are set to grayscale and the only colour in the foreground is black, which means that the video game does not use any other colours to help the player in any way. The camera is fixed to the player in a way where the player is always placed in the scene between ¼ and ¾ of the camera width, e.g. see figure 5.2. The player is not able to control this, as it depends on where in the level the character is.

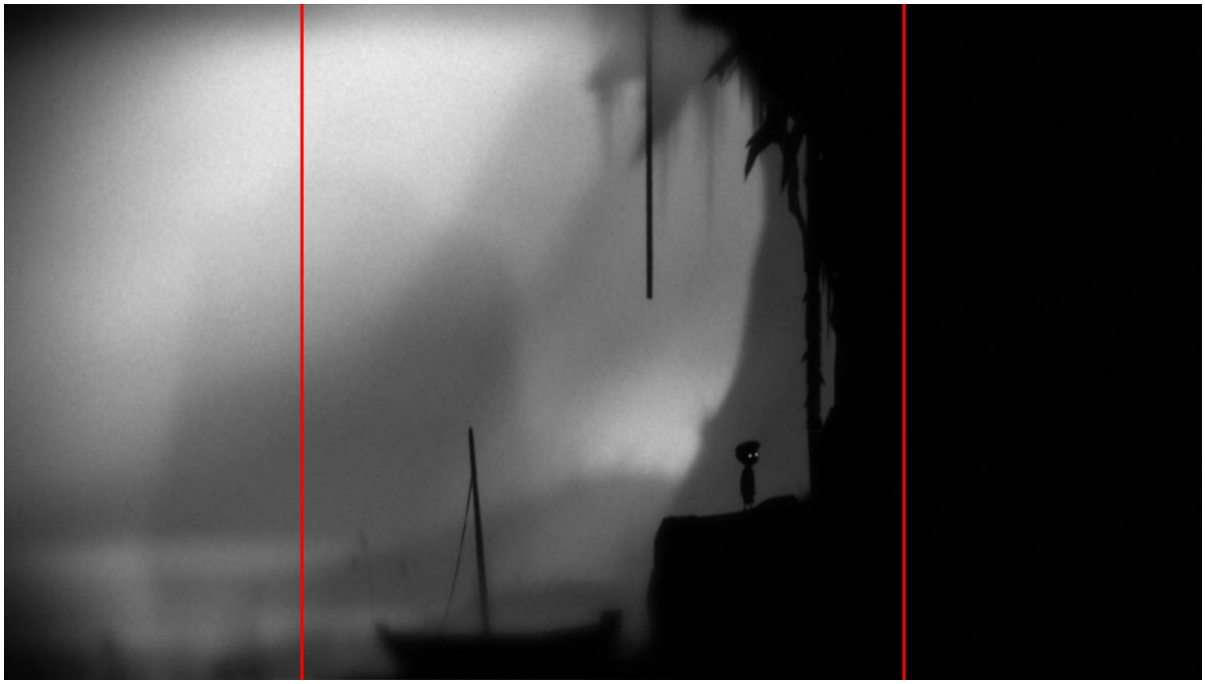


Figure 5.2 - The camera will place the character between the indicated red lines and will scroll to the side when the player moves to these lines, in the video game Limbo (Playdead & Microsoft Studios, 2010).

The most used **Emergent Mechanic** in Limbo (Playdead & Microsoft Studios, 2010) is form interpretation, as described in section 4.3, and Environmental Storytelling, as described in section 4.6. There is a contrast in form between the boy and the things in the game that try to kill him, his shape is round and smooth, while the things that try to kill him are usually sharp and triangle shaped. As seen in figure 5.3, we can see the boy on the left side of the image and in the middle are two traps that have triangle shaped spikes.

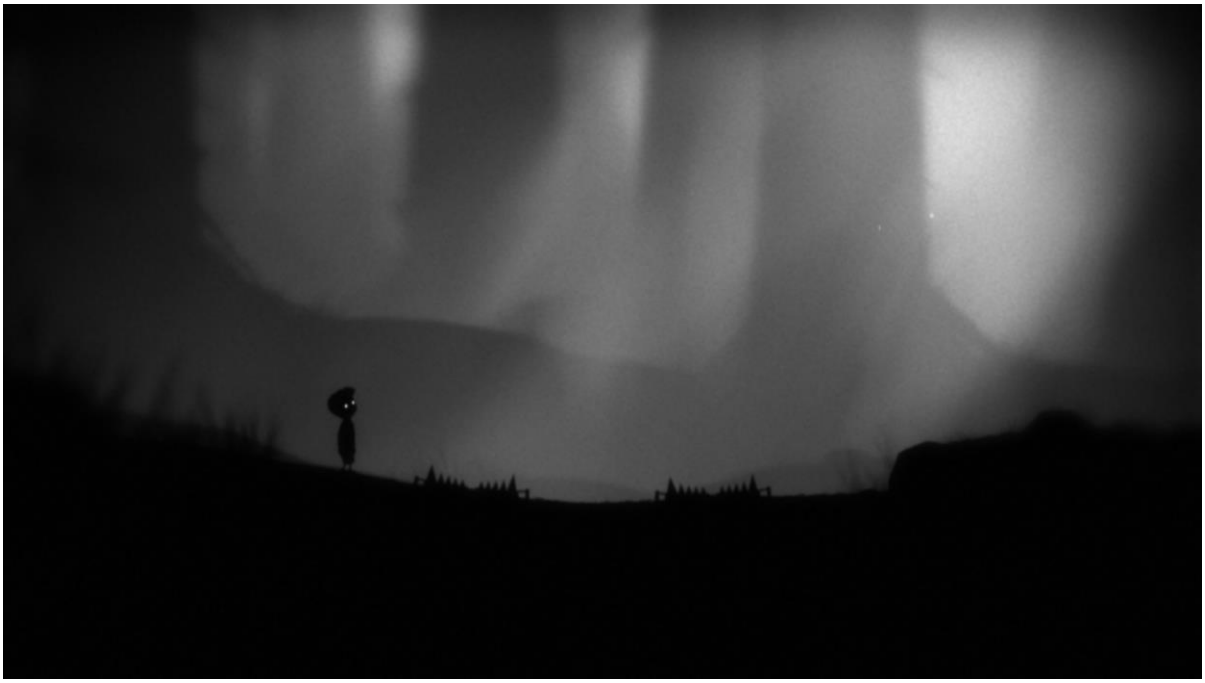


Figure 5.3 - Traps lying on the floor next to the player, in the video game Limbo (Playdead & Microsoft Studios, 2010).

Some of the dangerous objects are not depicted as triangle shaped and sharp. Limbo (Playdead & Microsoft Studios, 2010) uses knowledge from the real world, such as avoiding objects that seem heavy or unstable because they seem dangerous. The level design centres around putting the player in a state of mind (Jongeneel, 2013) and telling a story (Taylor, 2013), but to some degree refrains from using obvious foreshadowing, as that can be seen as part of the **Game Mechanics**. That does not mean the video game does not make use of foreshadowing, but that the indicators are so faint that they can easily be missed.

5.2 Journey

In Journey (Thatgamecompany & Sony Computer Entertainment, 2012) the player takes the role of a wanderer in the desert. The goal is to reach the top of a mountain that is far away in the distance. During the journey, the player may meet other players, although they can only encounter one at a time. Players may help or ignore each other as they see fit, but there are arguably better reasons for teaming up with another player than to travel alone. The wanderers have an ability to jump and float, which is only limited by the length of their scarves. The player may pick up certain symbols to increase the length of the scarf and in turn jump higher and further. There is another limit to the jump however, as a jump will use up energy from the scarf, which will then have to be regained. To do this the player can interact with certain objects and creatures in the video game by walking into them or calling out to them, which will then make them refill the power of the scarf, as seen in figure 5.4.

Figure 5.4 - The player calls out to a red creature that refills the energy of the player's scarf, in the video game Journey (Thatgamecompany & Sony Computer Entertainment, 2012).

The objects and creatures that are interactive are all marked with the colour red. Alternatively, players can interact and call to each other to regain this power to jump. Throughout the video game, the only text the player will encounter is for the player to understand controls, such as “press X”. The story of the video game is told by objects in the game world, such as ruins or other locations. There are walls with murals, depicting other wanderers as well as depicting some of the locations found in the world. There are also stone slabs at the end of every level, which shows a small cutscene when the wanderer meditates in front of it. The characters in the video game do not talk to each other, but communicate through visions in the cutscenes.

5.2.1 Identifying Emergent Mechanics in Journey

At the heart of Journey (Thatgamecompany & Sony Computer Entertainment, 2012) is Guidance through the use of a landmark: The mountain. A Landmark helps the player to navigate in an unfamiliar spatial 3-dimensional game world (Jongeneel, 2013; Piaskiewicz, 2014; Price, 2011), as mentioned in section 4.6. As the player is never directly told an objective, this landmark intuitively becomes the player's goal, as seen in figure 5.5.

Figure 5.5 - At the very beginning of the game, the player will be presented with the mountain that serves as the goal of the game Journey (Thatgamecompany & Sony Computer Entertainment, 2012).

At the same time, the game manages to make the desert “feel alive” (Jongeneel, 2013), as player movement and gusts of wind carry sand particles through the world. The player will discover the ability to “surf” on the sand dunes, as seen in figure 5.6, a mechanic that subtly and intuitively teaches the player new possibilities (Jongeneel, 2013; Taylor, 2013). While surfing the sand dunes the environment once again subtlety begins to guide the player, as they seek out the opportunity for this type of interaction.

Figure 5.6 - At times the player can surf down the hills in the desert, in the video game Journey (Thatgamecompany & Sony Computer Entertainment, 2012).

The video game also uses colours to guide the player, as a bright red colour is used on many interactive objects and friendly creatures to make them stand out in the environment (Jongeneel, 2013). At the same time, the video game uses white as a colour that seems to drain the red from the character and the interactive objects, to make the player feel overwhelmed and threatened. The colour choices seem to be in line with some of the colour symbolism previously mentioned in section 4.3. Red imbues the character with vitality and strength, while white in contrast shows the cold, empty and sterile aspects of the game world. To create a state of mind for the player while experiencing Journey (Thatgamecompany & Sony Computer Entertainment, 2012), white colour is used in snowy environments together with the movement and the poses of the main character to show that the character is not feeling well under these circumstances (Jongeneel, 2013; Taylor, 2013). The game also has a series of dimly lit ruins with a dark blue colour to show the player that the place is dangerous (Jongeneel, 2013).

5.3 Ori and the Blind Forest

Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015) is a platform adventure Metroidvania game, where the player controls the white spirit Ori. The goal of the game is to bring back the core of the spirit tree in order to save the forest and create balance. Throughout the game, Ori learns new abilities that the player can use to access new areas of the map. The abilities make the player able to reach new places in areas that they already have previously visited. After a while in the game, Ori get a companion called Sein, which is a helper that guides him and functions as his weapon. An example on how the attack look like can be seen in figure 5.7 below.

Figure 5.7 - Ori is located on the right, while Sein is in the middle attacking an enemy to the left. Image from Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015).

In this video game, there is a difference between the colour of friendly things such as Ori and evil things such as enemy creatures. E.g. in figure 5.8 Ori can be seen in the middle, an empowering tree on the left, that shares colours with Ori, and an enemy on the ledge to the right, coloured purple.

Figure 5.8 - Example of colours used in the video game. Ori and the tree coloured blue, enemy coloured purple. Image from Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015).

5.3.1 Identifying Emergent Mechanics in Ori and the Blind Forest

The beginning of the video game is a mix between cutscenes and gameplay. However, it is not clear when the player is given control of the characters or when they are controlled by a cutscene. It is easy to know where the player character has to go in the beginning of the video game, e.g. when controlling Ori's guardian for the first time, the player will see Ori as a bright light moving from left to right, as seen in figure 5.9.

Figure 5.9 - The guardian looking in the direction where the player needs to go. Image from Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015).

Later on, the video game opens up new paths that are only limited by the abilities of Ori. These paths are shown early in the video game, as the player can see collectible items and power-ups in places that Ori cannot reach until certain abilities have been acquired. This implies that the locations in the game have more possibilities open later in the video game that indicate the need of revisiting these points of interests. E.g. In figure 5.10, where the player will not be able to progress beyond the red thorny shrub on the right, until the ability to jump higher and further has been found.

Figure 5.10 - A red thorny shrub blocking the road for Ori. Image from Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015).

As mentioned earlier in this section, there is a difference between how good and evil elements are presented in the video game. Good elements are presented in light colours; blue, green and orange, see figure 5.11, while dangerous elements are represented by more aggressive colours like red and purple, see figure 5.12. This helps the player to differentiate between good and bad, while also helping when encountering creatures that have not seen before.

Figure 5.11 - Good elements that help Ori. Image from Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015).

Figure 5.12 - Dangerous creatures and elements. Image from Ori and the Blind Forest (Moon Studios & Microsoft Studios, 2015).

5.4 Mirror's Edge

In Mirror's Edge (DICE & Electronic Arts, 2008) the player takes control of Faith. A freerunning smuggler in a futuristic setting. The gameplay revolves around Faith jumping and running across rooftops, through offices and various other locations. The video game is fast paced and requires the player to learn and combine a number of moves, in order to move through the areas of the game. These moves can be running on walls, climbing fences and sliding under pipes. In order to keep the player moving in the right direction the video game has a feature called Runner Vision, which can be toggled on or off. When toggled on, the Runner Vision shows climbable objects in a red colour, adding contrast to the otherwise almost completely white city. It is not completely white however, as various areas are often highlighted in certain bright colours of mostly yellow, blue or green to indicate the building or area the player is in, as seen in figure 5.13.

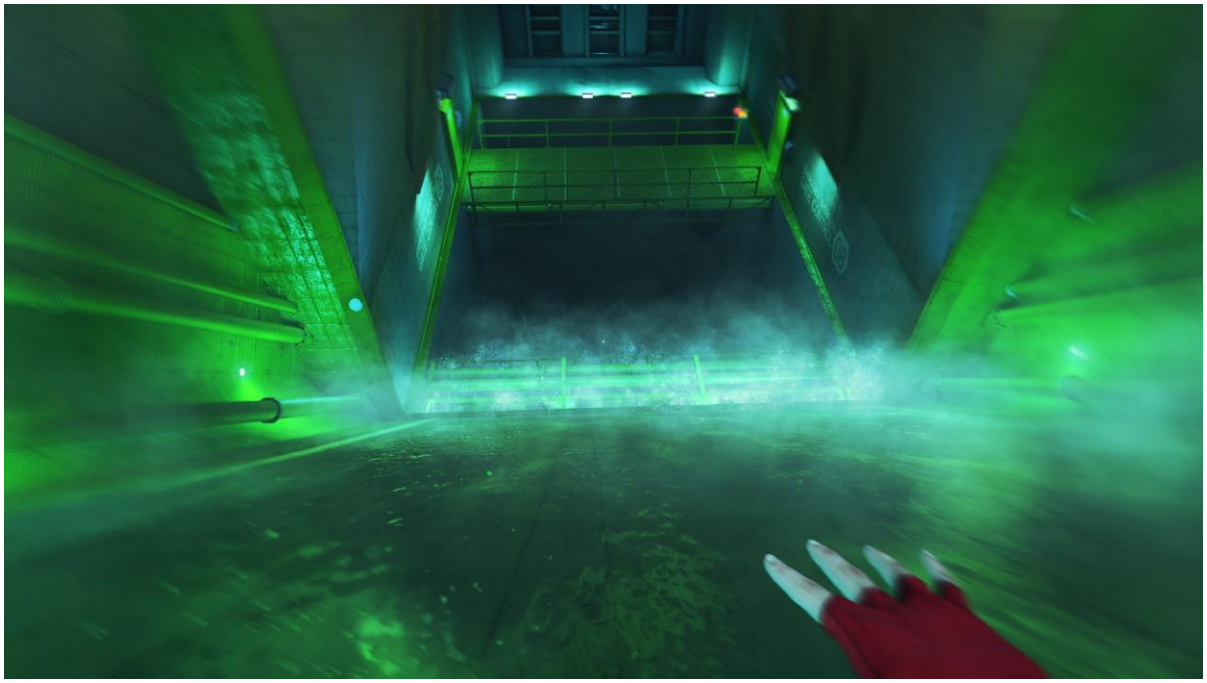


Figure 5.13 - The use of colour in Mirror's Edge (DICE & Electronic Arts, 2008).

Johannes Soderqvist, the art director for Mirror's Edge (DICE & Electronic Arts, 2008) mentioned the use of the colour palette in an interview with IGN:

> *"When it comes to specific colors we have a limited palette: red, orange, yellow, blue and green. Red is used for the runner vision. Orange and yellow is often used to subconsciously lead the player or simply because it looks great in direct sunlight. Blue is used when color is wanted but without leading the player. Blue also looks good in shadows. Green is practically banned from exteriors and is only used in interiors."*

(Thomsen, 2008)

5.4.1 Identifying Emergent Mechanics in Mirror's Edge

In the beginning of Mirror's Edge (DICE & Electronic Arts, 2008) the player is guided through a tutorial in order to learn what the different buttons control, such as jumping, crouching and turning 180 degrees. It also shows how pressing two buttons either at the same time or timing the press of the second button can change the outcome of a move. E.g. When the player is running and presses the jump key, it will result in a normal jump. However, if the crouch key is pressed at the same time, then the main character, Faith, will tug her legs up, to allow her to jump over fences without her legs getting caught. If the player instead waits with pressing the crouch button to just before Faith lands a high jump, she will roll to break her fall. When the player has learned that moves can be strung together, they will start playing with this on their own and the game design will constantly challenge til player with finding new ways to scale obstacles. Once the player has learned the controls of these movements, they will begin to understand how they tie together with the previously mentioned colours of the game world. The colours will begin to be associated with the possibilities available to the player, showcasing both Guidance of interactive routes and objectives. In the following part, an example will be given of a situation in Mirror's Edge (DICE & Electronic Arts, 2008), that gives indication of the possibility of completing an area in multiple ways, depending on how comfortable the player is with stringing together moves:

In this example, we have a staircase that needs to be scaled, as seen in figure 5.14, which can be done in a slow and secure way, or the fast and risky way. The slow way is more or less just taking the stairs to the top and exiting through the red door at the end. The risky way is a bit more interesting however.

Figure 5.14 - A staircase that the player needs to climb in order to progress, in the video game Mirror's Edge (DICE & Electronic Arts, 2008).

In figure 5.14, the staircase that needs to be scaled can be seen. Note the lockers that are past the left wall, as these would be the first in a series of goals for climbing the stairs in the quickest way possible. To get here the player will jump on the wall to the right, performing a move called wall-running, then changing the camera angle to look to the lockers and timing a jump to land on top of these lockers. As mentioned before the colours symbolise the "Runnervision", meaning the parts of the world that can be used for acrobatic movement or interaction, which the player learns early in the video game. Notice in figure 5.14 how the

wall is red, inviting the player to use it for wall-running and jumping. These are the kinds of hints that a player can expect to find in these situations. In figure 5.15, we see the staircase from the top of the lockers.

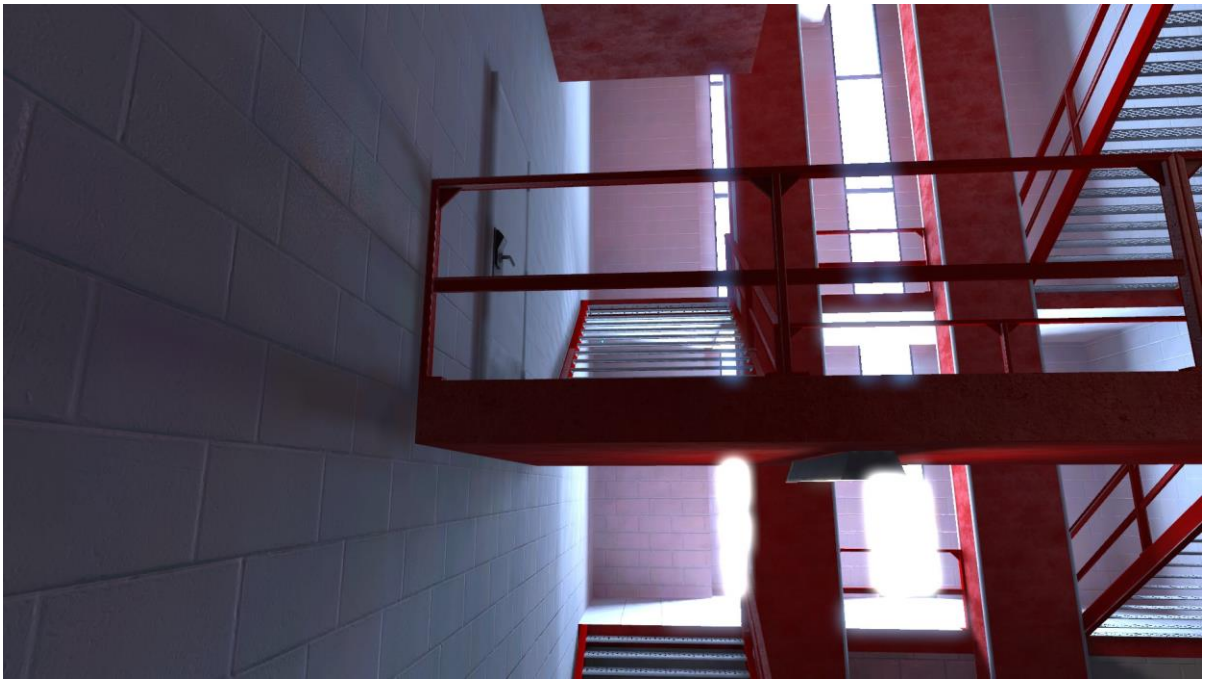


Figure 5.15 - A railing that can be climbed to get onto the staircase in the video game Mirror's Edge (DICE & Electronic Arts, 2008).

The fast player will use the momentum from the previous jump to wall-run along the wall that is behind the camera in this picture. This is more or less the same string of actions as the previous challenge to get to the lockers, but with the addition of including the crouch button, to make Faith tug her legs up to avoid the railing seen in figure 5.15. The player will now notice that the staircase continues further up, but is not connected to the far wall as seen in figure 5.16.

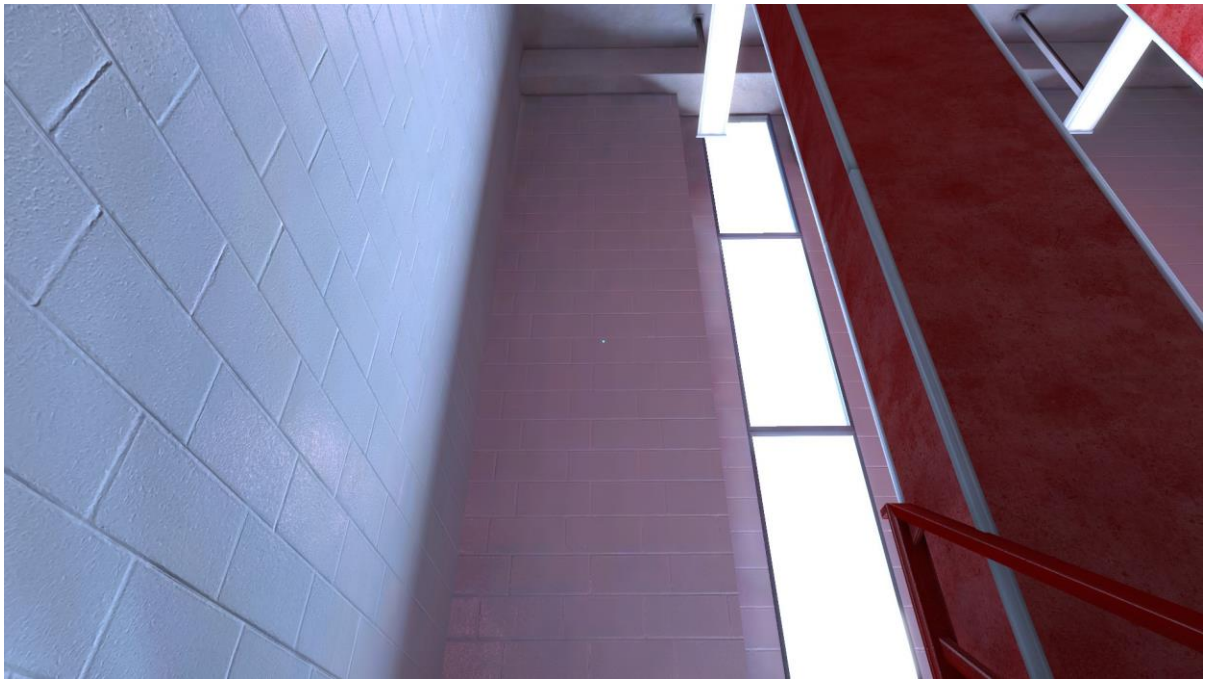


Figure 5.16 - The wall on the far side of the staircase, in the video game Mirror's Edge (DICE & Electronic Arts, 2008).

As was just explained, the staircase continues above the camera in this picture. To get up to this next section of the staircase, the player can jump onto the wall while quickly pressing the button to turn 180 degrees and then following that up with a jump. This brings the player to the top of the staircase, as seen in figure 5.17.

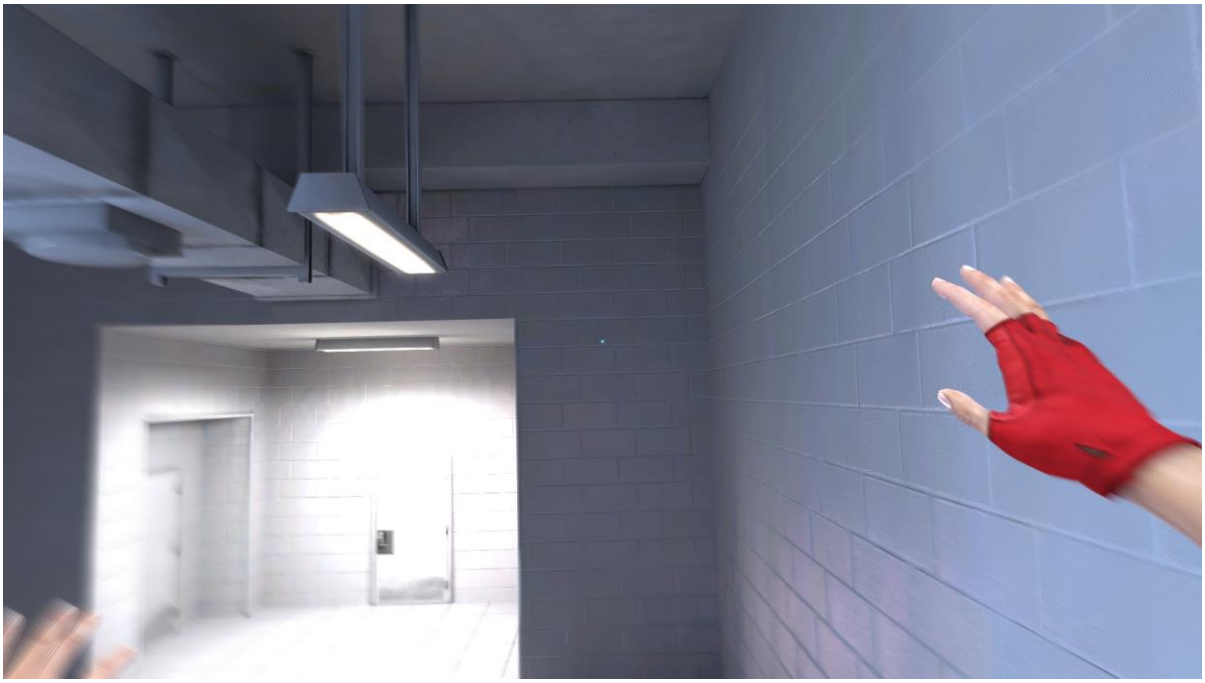


Figure 5.17 - The top of the staircase, as seen when jumping from the opposite wall, in the video game Mirror's Edge (DICE & Electronic Arts, 2008).

Stringing these combinations of buttons together to complete jumps are challenging and sometimes risky, yet feel very rewarding, even if only some of the jumps succeed. To put it into perspective, the run up the stairs to get to the end takes 17 seconds while the risky run takes 11 seconds. This means that even if the player fails a jump the penalty is not too harsh, as only a few seconds will be lost. In that way the video game does not punish the player for using the environment to try and create shortcuts. The video game opens up for replayability, as "time trial" levels are unlocked as the player progresses. These time trial areas are a mix of already played areas and new ones, so in some instances of the time trials the player can use previously found shortcuts to help set a time trial record.

5.5 The Elder Scrolls: Skyrim

The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011), is set in the large open fantasy world of Skyrim, with magic and strange creatures such as dragons, trolls and demons. The player takes the protagonist role of the Dragonborn. A character known in the world from prophecies, who has the power to use a type of magic, from speaking certain words from the language of dragons. The player can customise the played character as a male or female from a number of races and further choose the visual appearance of this character. The world may later in the game treat the player differently depending on the chosen sex and race.

Skyrim has a large number of quests and locations for the player to explore and will make more events available as the player progresses. The player can build the character and make it stronger through a skill tree. Every once in awhile the player will be able to place points in this skilltree and customise it in any wanted way. E.g. A player may be able to combine casting magic and fighting with a sword at the same time or sneak around with large two-handed weapons if so desired. The video game does not lock the player out of any skills on the skilltree when these are chosen, so there will not be any penalties in the long run for choosing a new direction for character progress. There are many stories to follow in Skyrim and many choices and consequences to experience. This all comes together in the roleplaying aspect of the video game, where the player chooses what kind of personality and reasoning is put behind the played character.

5.5.1 Identifying Emergent Mechanics in The Elder Scrolls: Skyrim

The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011) has a lot of small stories and events that can be experienced. Some are very direct while others are less obvious. A great example is at the very beginning of the video game. The player will be guided down a path by an NPC, where the player will find a small village. Upon entering the village, the first thing the player will encounter should be a chicken, as seen in figure 5.18. Players who have played previous video games in the series will know that the video game has a law system and will see the player as a criminal if he commits a crime, such as killing animals that belong to another person. New players may be tempted to kill the chicken however, and will soon encounter a guard telling them that they have committed a crime and will have to pay a fine or be sent to jail. If the player refuses then the guard will attack and the price of the fine will increase. This teaches the player early on about the consequences in the video game. It also challenges the player to be more careful and not get noticed while committing crimes, as stealing from innocent people and murdering are two big parts of the video game, if the player decides to pursue these ways of playing.

Figure 5.18 - A chicken should be the first thing the player sees in the centre of the screen upon entering the village. From The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011).

The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011) has a user interface that always highlights the way to the player's active quests. This can be turned off at any time during the video game. Even if it is turned off the video game will guide the player towards points of interest by using subtle pull to guide the player around. In some caves a small stream of water may guide the player to an exit or a treasure and at night there will be glowing bugs next to some areas of interest, like caves or shrines. In this way, the video game uses the subtle light of the bugs as well as the sound and movement of the water to show the player a direction that is worth investigating. As The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011) is not a linear video game it would not be a good idea to have Guidance pointing in only one direction, as this would go against the purpose of the video game happening in an open world. With the open world the video game needs to have these subtle clues as to where the player *can go,* rather than where the player *needs to go*. This makes the **Emergent Mechanics** a bit different from the linear games, yet even if the

hints are only subtle, the video game still draws attention to the locations for the main story, as these often can be seen towering in the distance or using more obvious signs of a path. This can for example be a trail of stone signposts leading to a large castle on a mountain, as seen in figure 5.19, where the player discovers new abilities as well as new leads on the main storyline.

Figure 5.19 - A trail indicated by a stone signpost with a piece of cloth waving in the wind in order to add movement and draw more attention. From The Elder Scrolls: Skyrim (Bethesda Game Studios & Bethesda Softworks, 2011).

5.6 Summary

Throughout the chapter we have seen examples of **Emergent Mechanics** in different video games. This has included many of the aspects we listed in chapter 4, e.g. colour, form, Environmental Storytelling, Guidance, camera and animation. Generally, many of the examples given are or include compositions, Mise-en-scene, and as such we feel the video games to an extent make use of **Emergent Mechanics**. The video games are very different in how they express their **Emergent Mechanics** and how well such methods are implemented. This degree of variation can point towards a lack of common design language and knowledge on the subject of guiding player behaviour and interpretation.

Chapter 6 Test and Analysis

The Unified Theory by Ralph & Monu (2015) is, as previously explained in section 2.4, a fusion of two theories to explain video games as a concept; MDA (Hunicke et al., 2004) and The Elemental Tetrad (Schell, 2008). Both of these theories spring from a developer perspective and has been combined and adapted in order to create a Unified Theory (Ralph & Monu, 2015) that also conforms to an academic point of view. Ralph & Monu (2015) refined their theory by having both game designers and academics provide feedback. While we have referenced and interpreted plenty of academic work onto the theory throughout this thesis, we have also included several sources from the video game industry, as well as included some of the gripes they have with academia. As such we have found it particularly important to get feedback on our addition to Ralph & Monu's (2015) theory from industry people in order to ensure validity across the spectrum. Our biggest issue with getting such feedback has been a matter of timing, as we consider the optimal approach being the same as was taken with the development of the MDA model (Hunicke et al., 2004): A workshop during an industry conference. However, any conference we would be able to attend, due to our geographic location, did not run within the timeframe we had available to refine our contribution. This left us with the option of a form of discussion group within an online fora and the issues of how to effectively communicate the concepts of both the Unified Theory (Ralph & Monu, 2015) and our addition. The following chapter will cover how we tackled this issue and the data gathered, as well as the problems and lessons learned along the way.

6.1 The product

While the group possesses some knowledge, when it comes to video production, storytelling and the visual language of the medium, these skills mainly revolve around the communication of narratives and not concepts. In the next section 6.2, we will be discussing the target audience of the production, but for now, this section will include some considerations in relations to the target platform. Our target audience, see section 6.2 for further details, was located within a Facebook group. We needed a way to communicate our concepts, without

losing audience attention (Statistic Brain Research Institute, 2016). A long, detailed explanation would be ignored and people would just continue scrolling to the next bit of content Facebook presented them with. However, Facebook currently autoplays videos in a muted state, which we saw as an opportunity to get people's attention. In addition to getting attention, there is the issue of maintaining that attention. This made us refrain from having a long runtime, even though the complexity of the matter that needed communicating would have benefitted greatly from further explanation. As for deciding what needed to be included from the previous chapters, we decided to include two elements. The essential elements were an explanation of the Unified Theory (Ralph & Monu, 2015), as this has functioned as a foundational element throughout this thesis and our addition to the theory, **Emergent Mechanics**.

The video production itself relied on a few different components: Adobe After Effects (Adobe, 2016a), a video special effects software tool, as we needed to visualise a concept. Adobe Photoshop (Adobe, 2016b), a photo editing and graphics software tool, in order to be able to create and customise assets for the video. Video footage from the game Spec Ops: The Line (Yager Development & 2K Games, 2012), a video clip from Game Maker's Toolkit (Brown, n.d.), as well as logos from software and hardware manufacturers related to video games. Adobe Photoshop (Adobe, 2016b) and Adobe After Effects (Adobe, 2016a) functions basically the same way, a series of elements are arranged and their properties are edit in layers, see figure 6.1. The main difference being Adobe After Effects (Adobe, 2016a) having a timeline for changes in those properties.

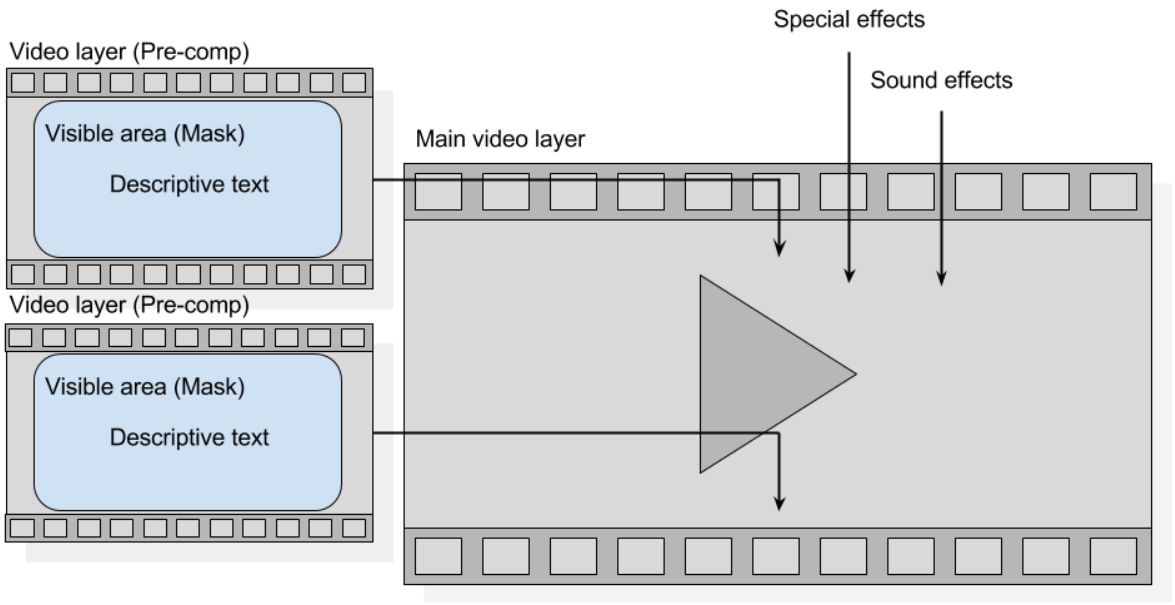


Figure 6.1 - A simplification of how Adobe After Effects (Adobe, 2016a) functions.

One of the ideas behind the presentation of the Unified Theory (Ralph & Monu, 2015) was using two simultaneous videos to present the idea of the **Emergent-** and **Interpreted Narrative**. One being of actual gameplay footage, the other being an artist's rendition of the same piece of gameplay. However, we were unable to find such pieces of video before reaching our own deadline. The technical implementation was already in place for the animation, allowing for the different classes to be displayed in a similar manner to the representation in Ralph & Monu's (2015) paper. The main difference being the previously mentioned video clips playing inside each class, as a way of explaining the definition utilising the video medium's potential. We ended up using still pictures inside the classes, as they were the closest thing we could find to the original concept idea, see figure 6.2.

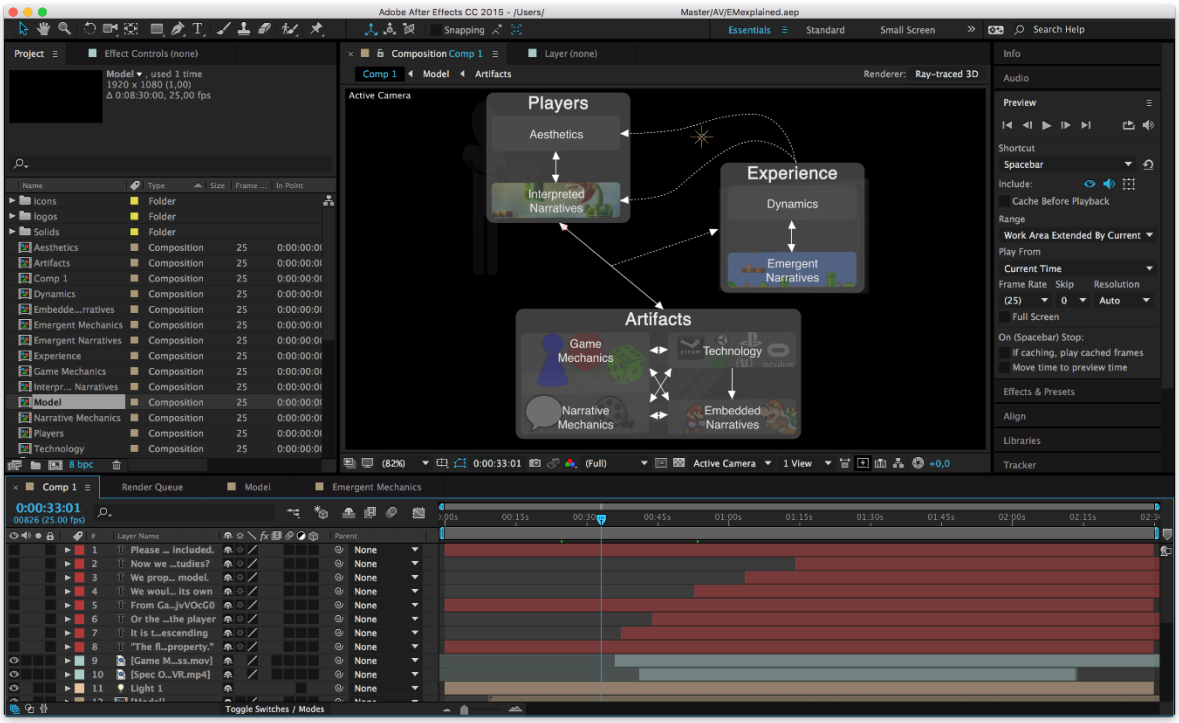


Figure 6.2 - A screenshot of the Adobe After Effects (Adobe, 2016a) composition of the video product.

Following the figure above, the features are as follows: The project folder, upper left, which includes every file used. This can switch to show the settings of video effects. Upper centre is the preview window, showing a video still or a few seconds of cached video. Upper right holds several tabs of different features and settings. Lower left are the layers of the frame, including plenty of toggle buttons and nested features. Lower right is the timeline: This shows when layers are active and when specific effects have certain settings. Adobe After Effects (Adobe, 2016a) automatically puts in the values between specified points, called keyframes.

Creating the initial ground work for the video to communicating the Unified Theory (Ralph & Monu, 2015) took a considerable amount of time. This was in order to ensure the different elements would be easier to work with in the long run. In addition, the process was slowed by being out of practice, when it comes to the workflow of the software. This rippled into

every iteration, even though familiarity returned as the work progressed. Only a few seconds of any change can easily be previewed, due to how heavy video editing taxes the available computer hardware. Any change that affects the entirety of the movie, no matter how small, has to be rendered fully to be viewed, a process taking up considerable time.

The process of producing a video took far longer than originally predicted and the return of gathered information could have been better, see section 6.6. Optimising the entire process and adding several further iterations would probably have yielded much better result, but it was not within our scope and the timeframe available. Some of the technical techniques could maybe have been reconsidered and simplified in order to lower both the time needed to implement changes and the time it would require to render these changes.

6.2 Background for Data Gathering

In order to evaluate our suggested **Emergent Mechanics**, we want to have a group of people that can discuss the addition to the Unified Theory, much like a focus group. A focus group is a group of people within a segment that the facilitator has specified (Sharp, Rogers, & Preece, 2007). In our case, this would be people, who work with games in any way, whether it be as game developers, game critics or game researchers. The focus group will have to discuss the preset agenda, that is developed to guide the discussion, but there is some flexibility to look into unanticipated subjects (Sharp et al., 2007). Usually when facilitating a focus group, the group meets up at a location and then has a discussion on a specific subject. We are going to change the format a bit, as we cannot meet up with a group to have a meeting, where everyone is in the same room. Instead, we are going to post our addition to the Unified Theory online, in order to make it easier to participate. Furthermore, we want to let the discussion go on for a timespan of between three to five days, in order to make sure that people have had time to think about the input that we are giving them and discuss it thoroughly. The reason for us to use this data gathering technique is because this type of method is good at gathering multiple viewpoints, as seen in figure 6.3 (Sharp et al., 2007). Additionally, the

technique highlights areas of consensus and conflict (Sharp et al., 2007). Later in the thesis, we will refer to this modified data gathering technique as an online focus group.

Technique	Good for	Kind of Data	Advantages	Disadvantages
Questionnaires	Answering specific questions	Quantitative and qualitative data	Can reach many people with low resource	The design is crucial. Response rate may be low. Responses may not be what you want
Interviews	Exploring issues	Some quantitative but mostly qualitative data	Interviewer can guide interviewee if necessary. Encourages contact between developers and user	Time consuming. Artificial environment may intimidate interviewee
Focus groups and workshops	Collecting multiple viewpoints	Some quantitative but mostly qualitative data	Highlights areas of consensus and conflict. Encourages contact between developers and user	Possibility of dominant characters
Naturalistic observation	Understanding context of user activity	Qualitative	Observing actual work gives insights that other techniques can't give	Very time consuming. Huge amounts of data.
Studying documentation	Learning about procedures, regulations and standards	Quantitative	No time commitment from user required	Day-to-day working will differ from documented procedures

Figure 6.3 - Overview of data gathering techniques from the book "Interaction Design" by Rogers, Sharp & Preece (2007, p. 214).

When the product was to be distributed to a group of people for comments, we had various thoughts on the best course of action. We could present this to a mailing list for academics, that is known as Games Research Network (University of Tampere, 2016). Games Research Network (University of Tampere, 2016) is as mentioned a mailing list for academics, but the topics are always game related in some way. Often academics will use the mailing list to promote their call for papers, to ask for material needed to conduct research or to ask for the opinions from other academics. We decided against using the Games Research Network (University of Tampere, 2016) after following them for a while, mainly because of the variety of academics included on the list. The mailing list includes academics from all kinds of fields, such as various computer science backgrounds, but also from psychologic, artistic or sociological fields of study. Because of this we would argue that Games Research Network (University of Tampere, 2016) would take our discussion in a direction that we are not interested in. As we mentioned in the introduction of chapter 3, Jesse Schell (2008) commented on academics overcomplicating definitions and theory in comparison to game developers. The Games Research Network (University of Tampere, 2016) would hopefully find the discussion very relevant to the network and this field of academia, but we would expect the discussion to be less relevant from the perspective that we wish to explore. With that being said, if we had the time, we would present a further developed version of the **Emergent Mechanic** description to the Games Research Network (University of Tampere, 2016), so that the definition of the term would be better explained, in order to help guide the discussion.

For our initial online focus group we instead decided to go with a closed Facebook group known as “The Player of Games” (Fonnesbech, n.d.). This group is made up of game developers, game journalists, game researchers and people involved in games media in general. This group has a focus on both game development and research, but in contrast to talking about academic approaches, they comment based on their individual personal experiences in relation to game industry. We acknowledge that the idea of **Emergent Mechanics** may seem different depending on experience, e.g. between a game designer from

an independent developer background and a game designer from a big budget production background. The problem with using The Player of Games (Fonnesbech, n.d.) as our online focus group is that we plan on keeping the members of the group anonymous. It may therefore be difficult to tell who works with game development and who has other backgrounds within games culture. Because of this, we may be unable to see where tendencies appear based on the job descriptions of the participants, which is why we will instead focus on the overall tendencies.

6.3 Pilot Test

In order to ensure the quality of the product, that will be presented to The Player of Games (Fonnesbech, n.d.), a pilot session will be conducted beforehand. This is done in order to correct possible mistakes, as well as things that may be misunderstood or misinterpreted. In order to test this we have reached out to fellow students and contacts that we trust to give an honest first impression of the product video. The pilot test is used to make a revised version of the product, which will then be presented to The Player of Games (Fonnesbech, n.d.). The pilot tests will be done individually with each tester, rather than as a focus group. This is mainly because it is impossible to gather our pilot testers physically or online due to their individual schedules, as well as our deadline for the test. Therefore, the test people are sent a pilot video individually to get each of their first impressions.

Very early in our pilot test we became aware that the version of the video product, that we showed them was not simple enough to understand. One of them told us that this could be because it was not something that he had noticed while playing video games, so it might be alright for being posted on The Player of Games (Fonnesbech, n.d.). With that being said, we are also concerned with the length of the video as it is around three minutes and we do not want it to be so long, that members of the group will not bother watching it. We added some explanation text to the easily misunderstood example from Spec Ops: The Line (Yager

Development & 2K Games, 2012) as it required the viewer to know the meaning of an American flag hanging upside down (Cornell University Law School, n.d.).

We also got some feedback on the first half of the presentation being a bit quick and incomprehensible compared to the second half, where the examples were being shown. Making the first half easier to understand would take up a lot more time for the video, as we would have to offer in-depth explanations and examples. This would once again become a video, that might scare away potential participants because of its length (Statistic Brain Research Institute, 2016). One of our pilot testers also mentioned the effects were drawing too much attention. This is something we that toned down, but we did not remove the effect entirely, as that would require too much work. It was also only suggested by one of the pilot testers, meaning that the others did not have the same problem or saw other things that took priority over it. Finally, we had some feedback that we had to ignore, as it was not relevant to the test or the product. This was comments on the audio needing better filtering or equipment such as pop-filters to avoid too much background noise. These was not possible improvements, since we only had the equipment we were able to borrow from the university.

We made some minor improvements based on the feedback from the pilot tests. We had scheduled two days for making these improvements before the deadline, where it would have to be posted to The Player of Games group. We ended up with a nicely polished video that was released. The audio could have been better as mentioned, but given the equipment used, it was adequate.

6.4 Data Gathered

The received answers have been added to the appendix as screenshots. The participants chose to remain anonymous and thus we have made sure that their names and images are not visible. For the same reason we will not be able to link to the specific topic in the group, although we have linked to the group earlier. The group is closed however, so people need to be verified by an admin in order to get access. In that way it would be possible to see the discussion on The Player of Games (Fonnesbech, n.d.) by being verified and searching for it. The participants of the group are already aware that other members of the group can see their replies and they know the risk of this. We tried to comment on some of the replies that we received, in order to get further comments on these and receive more data. In some cases, we would also write private messages to participants to have them elaborate. These private messages will not be in the appendix, as of the participants' requests.

Very early into the data gathering the members of the group started questioning the choice of name and suggesting new names instead of **Emergent Mechanics**. This would soon become the biggest discussion for the video. This was valid feedback and as such we welcomed the new names and reasons for these and invited people to give their feedback as to what **Emergent Mechanics** could be renamed. Someone also mentioned Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985) and the level called world 1-1, as this was a great example for a game dissecting mechanics and introducing obstacles in a safe way for the player. This is also valuable feedback as it shows that others are also noticing the **Emergent Mechanics**. We decided to have a look at the level World 1-1 to see how it compares to our previous case studies of Half-Life 2 (Valve Corporation, 2004) and Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011) when it comes to guiding the player. Our in-depth look at World 1-1 will be included in section 6.4.1.

One member of The Player of Games asked how Ralph and Monu's (2015) theory was different from MDA (Hunicke et al., 2004), to which we explained that the theory was built

from the concept of that very model. Another member mentioned that some video game genres might have a higher tendency of using **Emergent Mechanics** than other genres. E.g. Would **Emergent Mechanics** be used in strategy games and sports games as much as they would in an adventure game. These genres lie outside our field of expertise when it comes to video games, but we assume that **Emergent Mechanics** are still present, but used in other ways than the games that we are used to.

6.4.1 Super Mario Bros. World 1-1

To explain the very first level of Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985) and how it teaches the gameplay of the game, here is a walkthrough of the level called World 1-1. Our footage is taken with game capture from a Super Nintendo running Super Mario All-stars (Nintendo EAD & Nintendo, 1993), which includes a remade version of Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985). To our knowledge, the only differences between the original game and the one we played on a Super Nintendo are the updated graphics and sounds. Since we only had access to the Super Nintendo version this is the one we will use for the example.

In World 1-1, the player is introduced to the character Mario and nothing else, as nothing will come to attack the player, as seen to the left in figure 6.4. This will let the player get a basic understanding for the video game before the actual level begins, teaching mechanics like Mario's movement as well as the movement of the camera without obstacles. The player will be introduced to a series of blocks, as well as a creature known as a Goomba. As the Goomba moves towards Mario the player will realise that the only real way to get around the creature is to jump over it or on it. Further along the player will encounter blocks with question marks, as seen to the right in figure 6.4, where the first one drops a coin when the player jumps into it, indicating that this is something the player would want to collect.

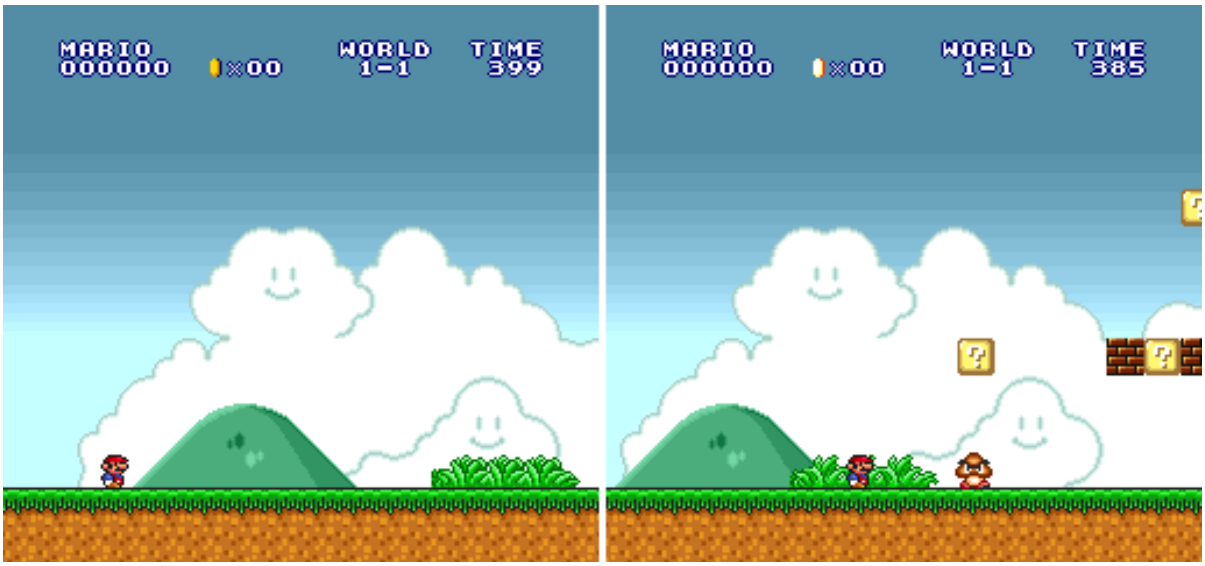


Figure 6.4 - On the left is an empty screen with Mario and on the right Mario has encountered a Goomba and some blocks with question marks. From Super Mario All-stars (Nintendo EAD & Nintendo, 1993).

The player will want to try jumping at the next question mark block as well, this time revealing a mushroom, as seen in figure 6.5, which moves to the right, bouncing back when it hits a pipe and changes direction towards the player. The player will at this point anticipate that the mushroom is another foe, but the way the blocks are placed the player is unable to make Mario run or jump away from the mushroom. As the mushroom hits Mario, the player realises that the mushroom is friendly, as it makes Mario big.

In a video interview (Eurogamer, 2015) Shigeru Miyamoto, who was producer, director and game designer on Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985), as well as Takashi Tezuka who was assistant director and game designer on the game, discuss World 1-1. Here Miyamoto describes that originally the enemy encountered in this first area of World 1-1 was a Koopa Troopa, a sort of turtle that leaves a shell behind when the player jumps on it. The shell can be kicked to damage other enemies or even Mario. They created Goomba and

changed it away from Koopa Troopa because they were worried that the concept of the shell might be too difficult for the player to understand this early in the game.

Next, the player will encounter three pipes that go into the ground. These are not important to a first time player yet, as the game does not introduce the purpose of these until World 1-2. They are still important, as the player will remember seeing these after being introduced to the mechanic behind them, which is to enter them in order to travel to other areas. These first three pipes that the player encounters holds no such secret. However, after passing two Goombas that are running back and forth between two pipes, the player may enter the second pipe at this location, thus being taken to a secret room. This secret room is filled with coins, as seen on figure 6.5, rewarding the player for exploring the level. Upon leaving the secret room, the player will be taken to the very end of the level, skipping several obstacles, which can be seen as another reward for exploration.

Figure 6.5 - To the left the player has hit the block that releases the mushroom. To the right the secret room with the coins can be seen. Note that the graphics looked different in the first iteration of the game. From Super Mario All-stars (Nintendo EAD & Nintendo, 1993).

If we return to the first playthrough, where the player ignores the pipe in the ground that can be entered, the next thing the player will encounter is a hole in the ground that Mario needs to jump across. Shortly after this, the player is introduced to Goombas falling off blocks, to show that they will not stop and turn around upon reaching the edge of a ledge or landmass. The player will also encounter another question mark block here and in cases where the player has returned to the smaller Mario it will hold a mushroom that makes Mario big again. If Mario is already big however, the block holds a flower that will change the colours of Mario's clothes, when picking it up as seen in figure 6.6. After picking up the flower the player may use the "B-button" to shoot small balls of fire at enemies, but for now, this is not important as we will return to the use of the "B-button" in a little while. After passing the first hole, the player will see a new hole in the ground, this time a bit bigger than the previous one. The player may try to jump on the blocks above to avoid the hole in the ground, which at the same time is one of multiple ways to teach the player that holding the jump button, the "A-button", makes Mario jump higher. After the encounter with the hole, the player will encounter the aforementioned Koopa Troopa, which looks like a turtle as seen in figure 6.6.

Figure 6.6 - To the left Mario has picked up a flower that changes the colour of his clothes. To the right Mario encounters a Koopa Troopa. From Super Mario All-stars (Nintendo EAD & Nintendo, 1993).

This encounter is built so that the player can either run into the turtle and have Mario take damage or the player can have Mario jump to the blocks above the turtle to avoid it. If the player lets Mario wait the for Koopa Troopa to pass the blocks, then Mario can jump on its head. If the player jumps on the turtle's head it will leave behind its shell. The first time the player encounters this it might seem like the enemy is still “active”, causing the player to jump on it again to make sure it will not spring back to life. Jumping on the shell makes Mario kick the shell in the direction opposite of himself. This can be used as a weapon, although the player will not know this yet, unless Mario is sent to chase the shell, at which point it will hit two Goombas. This makes the player realise that the shell is a weapon, as well as a hazard to avoid. Before we are done talking about the turtle encounter, there is one final thing to mention. If the player tries to kill the turtle under one of the rock blocks to save time and not wait for it to pass, then the player will notice that the rock block to the right is in fact a secret block, hiding a Star. Upon grabbing the Star Mario will start blinking and the music will change to indicate that Mario can no longer take damage and will instead kill every enemy he touches. Not only does this teach the player about the value of the Star, but also that blocks without question marks may hold valuable items and once again the game rewards exploration and replaying levels, just as the pipes mentioned earlier did.

Next, the level will present a staircase of blocks leading up to a gap and an identical flipped staircase on the other side as seen on Figure 6.7. In the previously mentioned interview (Eurogamer, 2015) Miyamoto explains that this is a way to teach the player the use of the “B-button” if the player has not already discovered that it makes Mario run. There is no hole in the world where this gap appears and Miyamoto (Eurogamer, 2015) says that this is to make sure that the player will gradually and naturally understand the rules of the game and learn what to expect from the level. Right after completing the jump over the first hole, the same challenge will be presented again, but this time with a hole in the world to present a bigger challenge to the player, as the safety-net is now gone as seen in Figure 6.7.

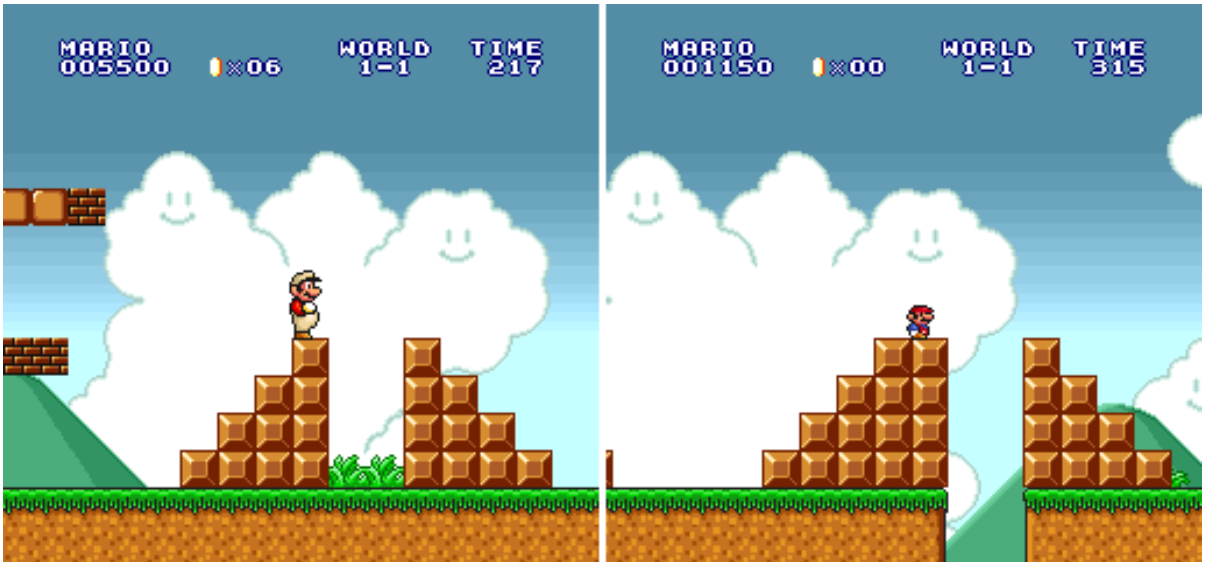


Figure 6.7 - To the right the safe stairs can be seen where the player is not punished for failing the jump. To the left is the stairs with a hole that will kill Mario if he falls into it. From Super Mario All-stars (Nintendo EAD & Nintendo, 1993).

This is something that can be seen not only in Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985), but in many of the Super Mario games (Nintendo, 1985-2015) in general. This is a concept where every new mechanic will be introduced in a safe environment, after which it is reintroduced in more challenging ways, often with the twist of mixing it with other mechanics. The very same thing can be seen with the very first Goomba that the player encounters earlier on, as it will be the only challenge on the screen at that time. Later these Goombas may come in pairs, in narrow spaces or even fall from higher ground in the level. Thus the first level does not only serve as an implicit tutorial for the controls in the game, but it also serves to tell how every mechanic in the game is introduced. Finally, the level leads Mario up a large staircase of blocks with an immediate drop afterwards. Upon moving forward, the player will see a flagpole that marks the end of the level. The next time the player gets to the end of world 1-1 the staircase may be used to jump from, in order to reach the top of the flagpole to get more points.

6.4.2 Comparing World 1-1's guidance to Half-Life 2 and Uncharted: Drake's Deception

Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985) was first released in the 1980's, while Half-Life 2 (Valve Corporation, 2004) was released in 2004 and the first Uncharted (Naughty Dog & Sony Computer Entertainment, 2007) came out in 2007. Yet the basic principles in guidance are the same, even if techniques and technologies have evolved. The camera in Super Mario Bros. (Nintendo R&D4 & Nintendo, 1985) guides the player from left to right, just as the camera in Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011) sometimes moves to guide the player as explained in section 4.7. The obstacles that Mario encounter are shown in safe environments before they are introduced again in more and more challenging environments, just as Half-Life 2 (Valve Corporation, 2004) introduces mechanics. One of these could be how the Barnacle enemy is introduced by demonstrating the nature of it before the player has a chance to get damaged by it as shown in section 3.3.4.

The Guidance has evolved however; so where World 1-1 could explain the main mechanics and theme of the video game in a single level, it may take considerably longer in a video game such as Half-Life 2 (Valve Corporation, 2004) because of the complexity of the video game, as well as its narrative. Mario can run and jump and the depending on the environment he jumps into or lands on there is a consequence of the jump. The jump remains the core mechanic for everything from attacking to dodging. If we look at Gordon Freeman in Half-Life 2 (Valve Corporation, 2004), the complexity has gone to a point, where Gordon must strafe, jump, crouch and mix these moves around in order to dodge bullets and enemies. At the same time, the player must use an entirely different type of input in form of mouse movement and precision in order to have Gordon attack enemies. The important thing to take from these examples however, is that even if there is over 20 years between the mentioned video games, they are all still memorable and fun to play. The accessibility from having well-implemented Guidance can be assumed to take a great deal of credit for this in particular.

6.4.3 Naming

Some of the responses we had during our feedback session, as well as during some of our supervisor sessions, was regarding the chosen name for **Emergent Mechanics**. It is a reasonable discussion to be had, as we could see throughout chapter 3, different people define emergence differently. Generally speaking, outside the world of video games, emergence is the rise of a pattern from small interactions. However, throughout the definitions that we have explored, there seems to be some disagreement as to if this process can be predicted or guided by the designer of a video game. E.g. Katie Salen & Eric Zimmerman and Jesse Schell seems to be at opposite ends with their individual perception of what it entails (Salen & Zimmerman, 2004; Schell, 2008). What we have described as being included in our definition of **Emergent Mechanics** leans toward Schell's (2008) descriptions of affecting player behaviour, and at the same time ties to the more general definition, whereas the effectiveness of **Emergent Mechanics** is formed by the sum of smaller contributions. The production team is in a position of more or less having full control of what the player is presented with, meaning they theoretically fully decide the smaller contributions to the sum of the experience. One can argue that the player is the big unknown factor in the system of emergence in a video game. In section 3.2 we described player types, mainly BrainHex (Nacke et al., 2014), that gives the designers a better understanding of how different players will approach the gameplay. This gives the ability to predict most behaviours that are not related to unintended bugs or design flaws.

One of the responses suggested renaming **Emergent Mechanics** to Embedded Mechanics, with the argument tying to many of the above reasons, seeing emergence as a by-product and not intent. The naming would fit well with other components of the theory, as it acknowledges that that the intent of the designer and the player may be at odds, or that that player behaviour lies outside what was expected. Furthermore, interpretation of gameplay and narrative elements may lie outside of what the naming **Emergent Mechanics** suggests. This is clearly shown in the original theory, as it has an entire class dedicated to interpretation

by the player. The more explicit implementation may also fit more clearly with a description of Embedded than Emergent, such as explicit tutorials or user interface elements that aid the player, as it can be argued that these hardly fit under **Game-** or **Narrative Mechanics**. Following the same logic, Gameplay Gestalt was another suggestion, which again points towards some of the previously mentioned notions, that **Emergent Mechanics** has to be the sum of the parts in order to reach the full effect. The difference in the word-choices, Embedded and Gestalt, for the suggested name change could imply very different approaches to looking at games and game design from the participants. In the conclusion of chapter 4, we talked about problems of common language, or the lack thereof, and with the difference in backgrounds and professions in this specific forum, it was an aspect we had not fully considered before opening the discussion.

One of the suggested names was Implicit Mechanics and if we are to be introspective, our focus has mainly been towards the more implicit or indirect end of the spectrum. This means that we might have avoided some discussion on naming by choosing something leaning more towards those words, rather than emergence. However, we still consider it to be a functional description. **Emergent Mechanics** is an attempt to channel player behaviour, but with acknowledgement that it will not work on certain players, either due to them actively working against it or accidentally not picking up on it. Most of the elements we have described as **Emergent Mechanics** can be seen as being most effective, when the player is unable to tell why they acted accordingly to what was intended by the designers of the video game. Choosing another description would in our minds also indicate another approach to what is the intended outcome. Environmental Storytelling already leans towards a more indirect form of creating narratives, so an approach more focused on identifying similar grounded techniques could have yielded another grouping of implicit and indirect storytelling methods. The name Implicit Tutorials was also suggested, meaning that we failed in communicating that we already saw this as an essential component of **Emergent Mechanics**. It also points towards a failure on our part to explain what we consider **Emergent Mechanics** to reach outside of the realm of teaching the player how to play the game. It also includes a plethora

of elements to communicate the **Embedded Narrative**, as well as ensuring flow, while making sure that the player, hopefully subconsciously, knows how to achieve their gameplay goals.

Underlying all the different naming suggestions might be another issue than communicating what **Emergent Mechanics** is and it might be that we have not defined it well enough for ourselves. Throughout chapter 4, we have listed different methods of influencing player behaviour and perception inside a video game, but we have not clearly mapped the relationship between such components.

6.5 Conclusions and reflections based on the data gathered

Based on the collected data from our online focus group, we have come to some conclusions about the test and the results. First of all we did not get the discussion we wanted, as we had hoped for much more discussion between the people interested in our contribution, which could be because of the low number of replies. Instead, people tend to use much more energy on the naming of the contribution, but mostly they still only approached us and not each other. Furthermore, it seems like not everybody understood what we wanted to communicate through the video and therefore asked questions about the meaning. After getting an answer, not everybody returned to make a reply on the new information given to them. This is something that should be in mind if we had the time to make another test before the project deadline. In order to make our video more understandable, we should have looked into including more of the sub-subjects used in the project to help explaining our addition to the Unified Theory (Ralph & Monu, 2015) in greater detail. This could have been done by giving the focus group access to some of the most important articles and blogs used in this project.

As mentioned, people in the focus group had focus on the name of the addition to the Unified Theory. The reason for this might be that there is a difference in how academics and the industry are naming terms and that the academics have a higher need for standardised definitions, as Schell (2008) points out in chapter 3. On the other hand, this might cause confusion about the addition and therefore the naming should have to be tested before taking it to a focus group.

We can conclude that we should have used more time on the pilot test of our video. However, we did not feel like we had the time to do more iterations on the video and still have the time to show it to the online focus group and analyse the data collected. This is based on how time consuming it is to make even small changes to the video, as mentioned in section 6.1. We felt that there was some problems by having an online focus group instead of a normal focus group, in relation to having people elaborating on their opinion. This is a bi-product of us having a hard time keeping people focused on the subject, which may have been avoided by having a focus group in a physical location.

6.6 Test Discussion

We feel like this online focus group did not meet our expectations for what we could have gotten from it. For this reason, it would be a good place to start the discussion, if this project was to go on. For now we see two ways that the data gathering could continue, where one would be to improve the online focus group and the other version would be to have a physical focus group. We still think that having a discussion about the addition is the best way to gather information on what others think about our contribution, because it makes rooms for the group to discuss and understand other perspectives and thereby get a better result.

Focus group

In future testing a physical environment could prove valuable, so that instead of using an online focus group, a normal focus group, where people are present in a room at the same time to discuss the subject, would be desirable. This would give us as facilitators more control of the discussion. We think it could be beneficial to have a lecture about Ralph & Monu's (2015) Unified Theory before the discussion, to make sure that everyone understand it and everyone have the same base knowledge on the subject.

Online focus group

Any attempt to remake a discussion on **Emergent Mechanics** might require participants to be of the same understanding of the material behind the subject. Making another video, which has the purpose of informing the online focus group of the Unified Theory by Ralph & Monu's (2015) before attempting to discuss the addition we made to the theory, might prove constructive. As for the video we made, it would require further iterations to make the content more informative, to make sure that the discussion is on topic.

6.7 Summary

One of the first things we learned from this chapter, is that we underestimated how time consuming it is to make a video. This resulted in a lot of time being put into making the video that we posted in The Player of Games (Fonnesbech, n.d.) Facebook group. This was in order to use them as a focus group for our addition, **Emergent Mechanics**, to the Unified Theory by Ralph & Monu (2015). There was a few problems that could have been avoided by having more time to test our product thoroughly before posting it to our online focus group. The problem was that the communication of the concept in the video was not as good as we had hoped. Therefore, we were left with conversation-stopping questions instead of an organic discussion. Another problem was that there was a tendency to focus on the name we gave **Emergent Mechanics**.

If this project has to continue, then it will be important to look into how the information is gathered to ensure valuable data. We suggest investigating other methods, in order to gather the information wanted. A physical focus group method might be a better choice than the online adaption that we used.

However, while the test did not yield as much discussion and data as we had hoped for, it still raised some questions we were yet to ask ourselves. In the following chapter we will further discuss what defines **Emergent Mechanics**, as well as the relationship between components and if the naming is the correct description for what we are trying to define.

Chapter 7 Discusion

Throughout this thesis, we have been looking at several different aspect of video games, exploring different forms of narratives, emergence and definitions. In section 3.4 we defined **Emergent Mechanics**:

> ***Emergent Mechanics:*** *Rationalised design choices made in order to promote certain desirable Emergent- and Interpreted Narratives in relations to Game Mechanics and Embedded Narratives.*

This chapter will be a discussion regarding the validity of our proposition, using the chapters following the original definition as arguments for and against. This includes what we have defined as being parts of **Emergent Mechanics,** see chapter 4, examples of **Emergent Mechanics** from a series of small case studies, see chapter 5, and the feedback we got when discussing **Emergent Mechanics,** see chapter 6. Furthermore, this chapter will include thoughts and realisations gained from the process as a whole. The re-evaluation will focus on **Emergent Mechanic**s in regards to the model, the relationships between **Game-**, **Emergent-** and **Narrative Mechanics** and the naming of **Emergent Mechanics**.

7.1 Re-evaluating our addition

In section 3.4 we suggested the addition of **Emergent Mechanics** to the Unified Theory (Ralph & Monu, 2015), as well as taking outside influences into account, see figure 7.1. Throughout chapter 4, we ran through a range of elements that we considered to fall under the umbrella of **Emergent Mechanics** and attempted to identify how they can impact **Emergent-** and **Interpreted Narratives**. However, as many of those fall outside our field of expertise, the functionality of every subject covered would greatly benefit from further scientific exploration. If any of these subjects have already been explored, then these studies should be used to evaluate our conclusions. Nonetheless, we attempted to identify their impact and

usage with a series of small case studies throughout chapter 5, including such games as Limbo (Playdead & Microsoft Studios, 2010) and Mirror's Edge (DICE & Electronic Arts, 2008).

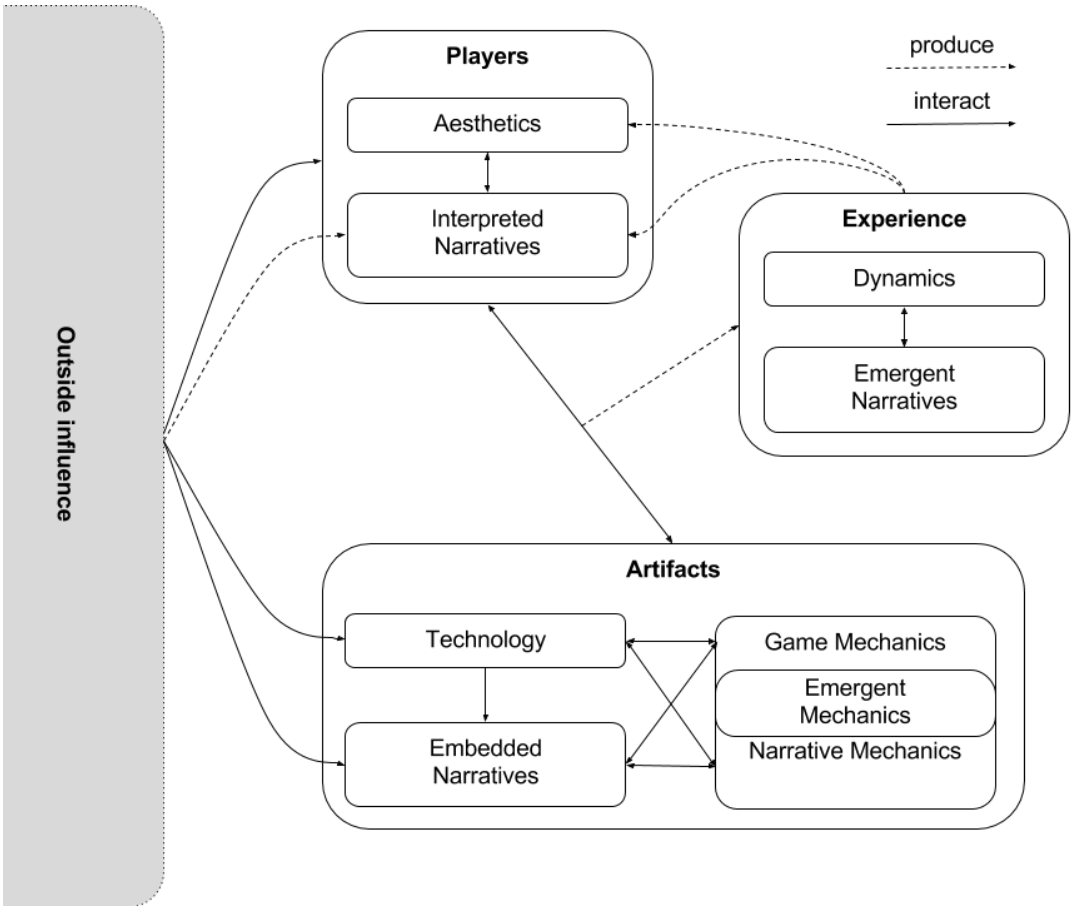


Figure 7.1 - The suggested addition to the Unified Theory (Ralph & Monu, 2015) from section 3.4.

In chapter 6, we described our attempt at getting feedback on the suggested addition to the Unified Theory (Ralph & Monu, 2015) through an online fora, in the form of a discussion group on Facebook. However, this did not yield as much discussion, and thereby data to work with, as we had hoped for. However, in relations to the feedback we got, as well as reflections from continued work with the subjects, one realisation we have come to is how unclear the boundaries are between the categories of **Game-**, **Emergent-** and **Narrative Mechanics**. We acknowledge that the additions we included, as seen in figure 7.1 above, do not thoroughly

reflect this. In some ways, the entirety of the three mechanics can be seen as a gradient, displaying different levels of belonging to each of the three categories, see figure 7.2.

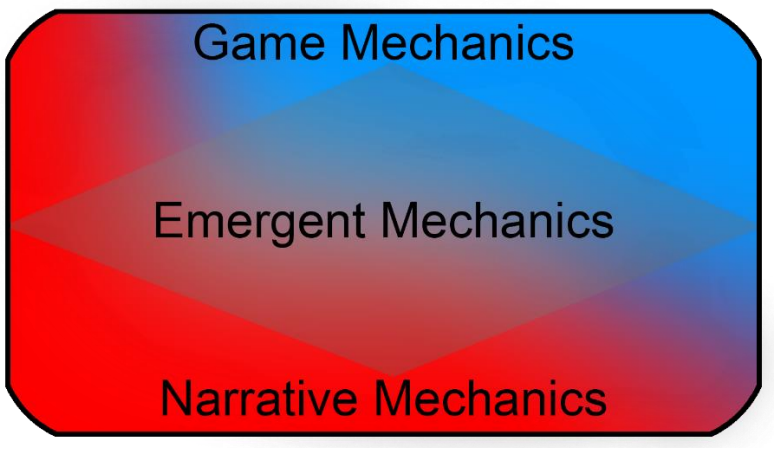


Figure 7.2 - An attempt at visualising the gradient relationship between Game-, Emergent- and Narrative Mechanics, e.g. it can be argued the mountain in Journey (Thatgamecompany & Sony Computer Entertainment, 2012) falls within all three categories.

Other mechanics can be seen as being located different places on an additional axis from implicit to explicit. E.g. The different ways of creating "signs" and "arrows" for the player to follow, seen in section 4.6, goes from being embedded in the game world to being a part of the user interface instead. However, the outer points of such an axis are arguably not easily defined. An additional issue is how much complexity can be added to the figure without ruining readability. We have mainly focused on the more implicit spectrum of **Emergent Mechanics** throughout this thesis, this springs from our initial starting point, as we began looking into Environmental Storytelling from a game design perspective and not a level design perspective. We are still of the opinion, that the identified **Emergent Mechanics** has a place in game design, hopefully ensuring that it is taken into consideration throughout the entire production when appropriate, as well as in academia. Our previous work can be seen as having led us to a preconceived conclusion on this subject. E.g. The mentioned study of player behaviour in different lighting settings, see chapter 1. However, with the issue of us not

knowing where in the context of game design and the Unified Theory (Ralph & Monu, 2015) such an observation on behaviour would fit in, regardless of preconceived notions. The effectiveness of implicit **Emergent Mechanics** may also be very hard to measure on their own, especially if they can be considered very subtle. Add to that the question of how one would categorise **Emergent Mechanics** on an axis from implicit to explicit. In any case, a 90% success rate in any form of implicit guidance should be considered a great result. E.g. Jesse Schell (2008) set 90% as their required success rate, when creating a Disneyland experience. In addition, some player types will most likely deliberately go against such guidance, see section 3.2 for more information.

7.2 Mapping components

One of the issues identified in our test was that we are yet to have defined the relationship between the elements that we considered to fall under the umbrella definition of **Emergent Mechanics**. The previous section describes the already gradient relationship between the three mechanics. The same can be said for many of the elements described throughout chapter 4. E.g. Many times the very foundation of Environmental Storytelling and Guidance depends on the expected interpretations of form and colour, and is in turn a part of the Mise-en-scene delivery, see figure 7.3.

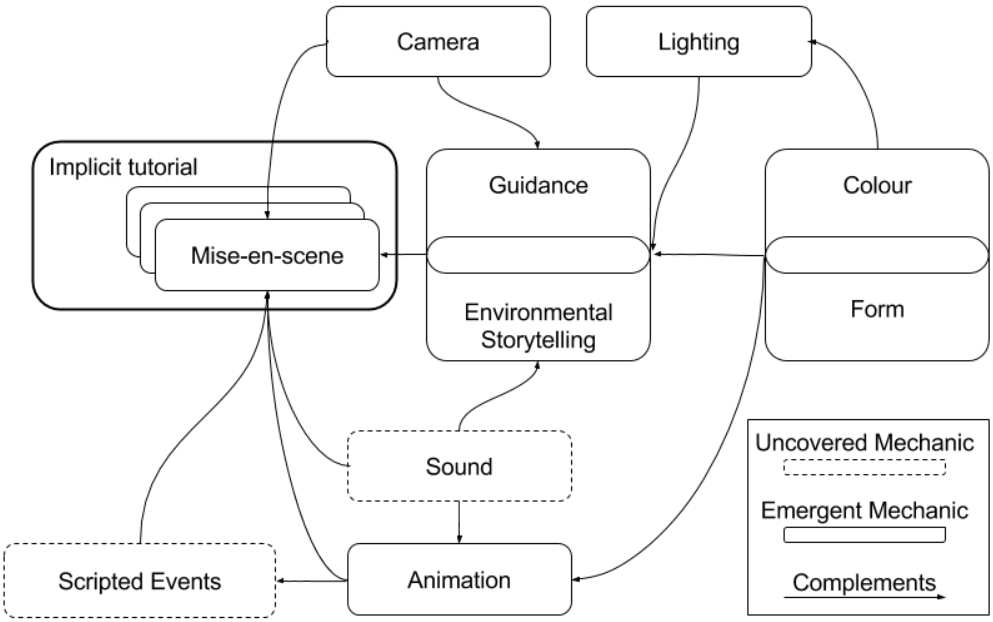


*Figure 7.3 - Draft of relationship between covered elements of **Emergent Mechanics**.*

The complexity of any figure attempting to explain the relationship with the different components can quickly become unmanageable. E.g. Figure 7.3 above does not attempt at explaining the individual relationships of the elements with **Game-** and/or **Narrative Mechanics,** yet it could be considered to include too many relations as it is. It may not make sense to attempt to fully map every relationship, but it should instead be done on an element-to-element basis, in order to understand where it draws influences. Additionally, figure 7.3 above includes certain elements that have not been covered or have only slightly touched upon. They are not subjects of interest to what we intended to research during this project, but it could be included in any future work regarding **Emergent Mechanics**.

7.3 Impact of Technology

The influence of technology on the different aspects of **Emergent Mechanics** or the Unified Theory (Ralph & Monu, 2015) as a whole, is an aspect we have not touched upon. Nonetheless, some aspects have a huge impact on what is possible with video games. A controller is an abstract method of input; only a certain number of actions are usually available to the player and they have to learn the relationship between which button has what effect. This abstract nature also means that the game has to teach the player each time there is a new option bound to a button, so while video games in theory offers limitless possibilities, the method of input is a limiting factor. The nature of different input methods also lend themselves very differently to **Game Mechanics,** which in turn dictates what kinds of narratives work in conjunction with the input methods. The object manipulation of a touch based video game like The Room (Fireproof Games & Fireproof Studios, 2012) will most likely function awfully on a controller, while the action gameplay of Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011) will suffer from the lack of physical buttons on touch devices.

The current push towards Virtual Reality brought with it an awareness of the limitations of different technologies. One of the most popular genres, first person shooters, does not function well within Virtual Reality yet. This is because the combination of a direct, as well as an abstract input method creates a disconnect in the experience for the player. This can be observed in Giant Bomb's coverage of the launch of both the Oculus Rift (Giant Bomb, 2016a) and HTC Vive (Giant Bomb, 2016b). Players have direct 1 to 1 control of their vision, but large-scale movements are done using abstract controls. Many of the current first person shooters can be said to come from a "common gameplay language", something that is yet to be established for Virtual Reality. As different types of gameplay lend themselves to different kinds of narratives, and Virtual Reality is yet to have found a dominant game type, the video game medium has yet to see what kind of narratives will emerge from this new frontier.

7.4 Emergent Mechanics through gameplay

When E. Adams (2014) talked about **Emergent Mechanics**, he referred to when **Game Mechanics** had such a synergy, that they encourage experimenting or changing behaviour. We have throughout the thesis had more focus on suggested behaviours, narratives and interpretations through implicit methods. However, we have not been examining how these are or can be affected through the core **Game Mechanics**. We have touched upon how perceived possibilities can be increased by adding more potential interactions, see section 4.1. While unintended emergent behaviour, such as rocket jumping (Juul, 2005), can be seen as an interaction only between player and core mechanic, such behaviour would not be interesting to the player, unless the level and **Emergent Mechanics** design would offer an advantage of doing so. E.g. Rocket jumping as a concept would be useless in Wolfenstein 3D's (id Software & Apogee Software, 1992) flat level design. The concept of "Fog of War" could also be classified as an **Emergent Mechanic**. This concept is usually found in strategy games, where the player can see the layout of any part of the map, they have previously explored, while any events happening outside the player units line of sight is hidden behind the fog of war. Whenever a player can see fog of war, they are left guessing as to what is going on outside of their field of vision. If they know of enemy units, they might start imagining placement areas of these troops and set up their own base, in order to prevent an attack or to counter-attack. Additionally, revisiting already explored areas might reveal signs of previous activity. This could be signs pointing towards combat, such as corpses and debris, or resource gathered by third parties.

7.5 Singleplayer vs Multiplayer Emergence

One of the responses we received during the focus group referred to Jesper Juul's paper "*The Open and the Closed: Games of Emergence and Games of Progression*" (Juul, 2002). As we have maintained a mainly single player experience focus throughout the thesis, we have chosen not to investigate this paper further, as it focuses on computer game structure in multiplayer games. Generally, there might be many of the aspects, which we explored throughout chapter 4, that would express themselves differently in multiplayer settings. Furthermore, in video games such as Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011), the singleplayer is narratively focused and the multiplayer is more or less focused on the ludological aspects of the game. If we are to point towards obvious **Emergent Mechanics** in multiplayer, the sniper tracing of Unreal Tournament (Epic Games, 2014-2016) will serve as a good example. Whenever a player shoots the weapon, it leaves a trail, disclosing the point of attack to other players. This solves the issue of players hiding, usually sarcastically called camping in video game terminology. Another solutions for the same issue can be seen in later iterations of the Battlefield-series (EA DICE, Visceral Games, & Electronic Arts, 2002-2015), where sniper locations are made visible by the reflection of the rifle-scope.

Chapter 8

Our initial focus was towards some of the more implicit methods of conveying information to players of video games. This approach can be seen in our problem statement, which looks as follows:

> *"Indirect methods, such as Environmental storytelling, can be used in video games to enhance the experience of the gameplay and narratives. The designer can enable certain interactions and encourage exploration in order for the player to be able to discover self-contained stories as well as gaining understanding of the game world and the game mechanics within it"*

We used this problem statement as a stepping-stone to define a series of research questions, which again underlined our interest in the implicit aspect of communication of concepts and narratives:

Research questions:

1. *How do video games relay narratives and enjoyment, and in what way do different aspects of the video game experiences work in conjunction with one another?*
2. *Which narrative mechanics are used to indirectly emphasise video game narratives and are these indirect methods represented in video game models?*
3. *What can be used to indirectly emphasise video game narratives outside fields of study or content production?*
4. *How are non-fundamental elements of video game mechanics or narratives represented and functioning within video game design?*

To explain how video games relay narratives and enjoyment, we have incorporated Ralph & Monu's (2015) suggested Unified Theory of Digital Games, which was introduced in section

2.4. However, as this is a newly suggested theory, we further explored and compared their definitions to the work of several authors with very different approaches. These authors include Henry Jenkins, Espen Aarseth, Chris Crawford, Katie Salen & Eric Zimmerman, Jesper Juul, Jesse Schell and Chris Bateman, as seen throughout chapter 3. One of the definitions we put under scrutiny was Emergence or **Emergent Narratives**, mainly due to the authors' definitions looking similar, even if the elements included were different. The theory by Ralph & Monu (2015) attempts to explain every aspect of video games in a simple model. The theory depicts three classes: The **Players**, the **Artifact** (video game and technology required to play) and the **Experience** (Ralph & Monu, 2015). The relationship between these three classes becomes an attempt to explain how the narrative is perceived and enjoyment is drawn from the **Experience**, see figure 8.1 below.

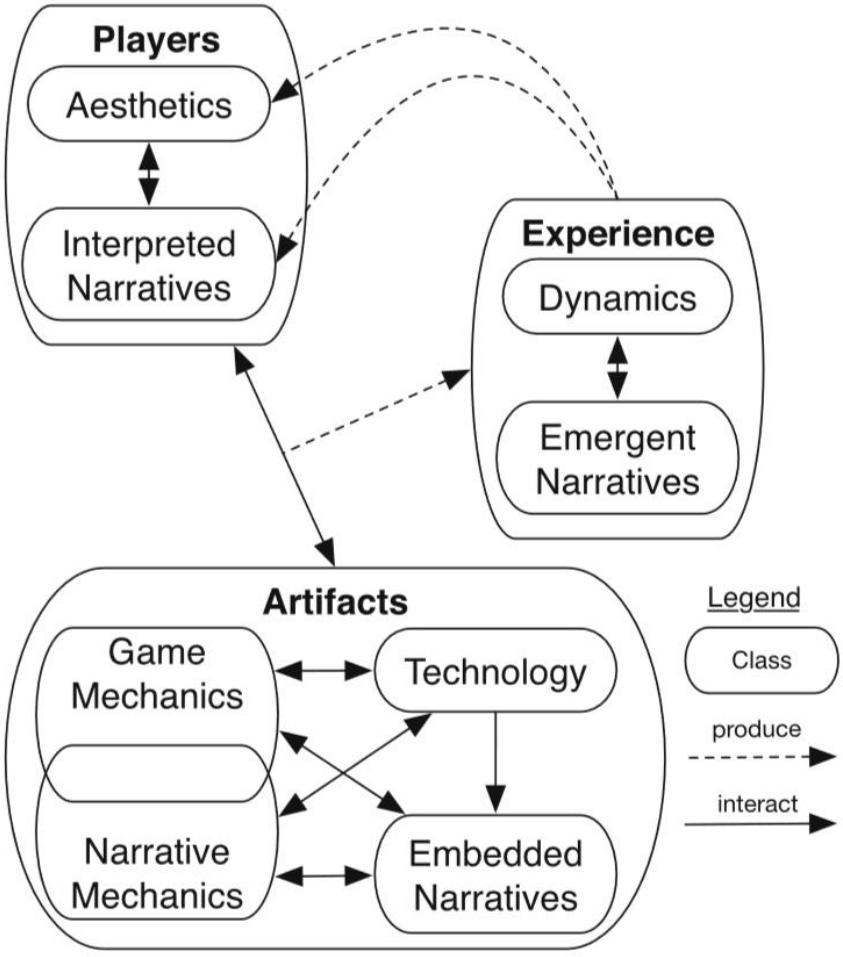


Figure 8.1 - Ralph & Monu's Unified Theory (2015), for further explanation, see section 2.4.

Our motivation, as outlined in section 1.1 and 1.2, was to study indirect methods of storytelling, emphasising a video game's narrative. Furthermore, we wished to uncover the relationship to such methods from the previously mentioned model by Ralph & Monu (2015). However, as mentioned with **Emergent Narratives**, what defines such a narrative and what is considered methods of communicating these; do not always seem to be clearly defined in video games research. Problems arise in relations to whether or not **Emergent Narratives** is something that can be affected or channelled by video game design. Salen & Zimmerman (2004) uses the term narrative descriptors to define design elements with the purpose of affecting player interpretations of a situation, see section 3.1.3 for further details. Schell (2008) describes how certain design decisions can make players act according to the wishes of the designers in around 90% of cases, see section 3.1.6. This can be observed implemented by game designers in video games, such as Half-Life 2 (Valve Corporation, 2004), which uses implicit tutorials to guide the **Player**'s **Emergent Narrative**, see section 3.3.4. To guide player behaviour, a pallet of different techniques can be observed working in conjunction in order to achieve such Guidance. Such methods of Guidance do not seem to be represented in Ralph & Monu's Unified Theory (2015), as they are often located between **Game-** and **Narrative Mechanics**, yet game design reasoning for Guidance defies categorisation as either of these mechanics. Due to this, we suggested naming the overlap between the previously mentioned classes to **Emergent Mechanics**, as these design choices are often motivated by the concept of guiding the **Player**'s **Experience**. We defined **Emergent Mechanics** in section 3.4 as follows:

> ***Emergent Mechanics:*** *Rationalised design choices made in order to promote certain desirable Emergent- and Interpreted Narratives in relations to Game Mechanics and Embedded Narratives.*

In addition to the definition of **Emergent Mechanics**, we also wish to recognise such elements as narrative descriptors (Salen & Zimmerman, 2004), which draw on references the player has obtained from outside the Unified Theory (Ralph & Monu, 2015). Jenkin's (2004) different

video game architectures often utilise such outside sources, e.g. evocative spaces are often video games set in universes familiar to some players. As such, an evocative space has certain expectations to live up to, by staying true to what is possible within the narrative of a specific world. In order to include **Emergent Mechanics** and these outside influences, we suggested an updated model in section 3.4, see figure 8.2 below.

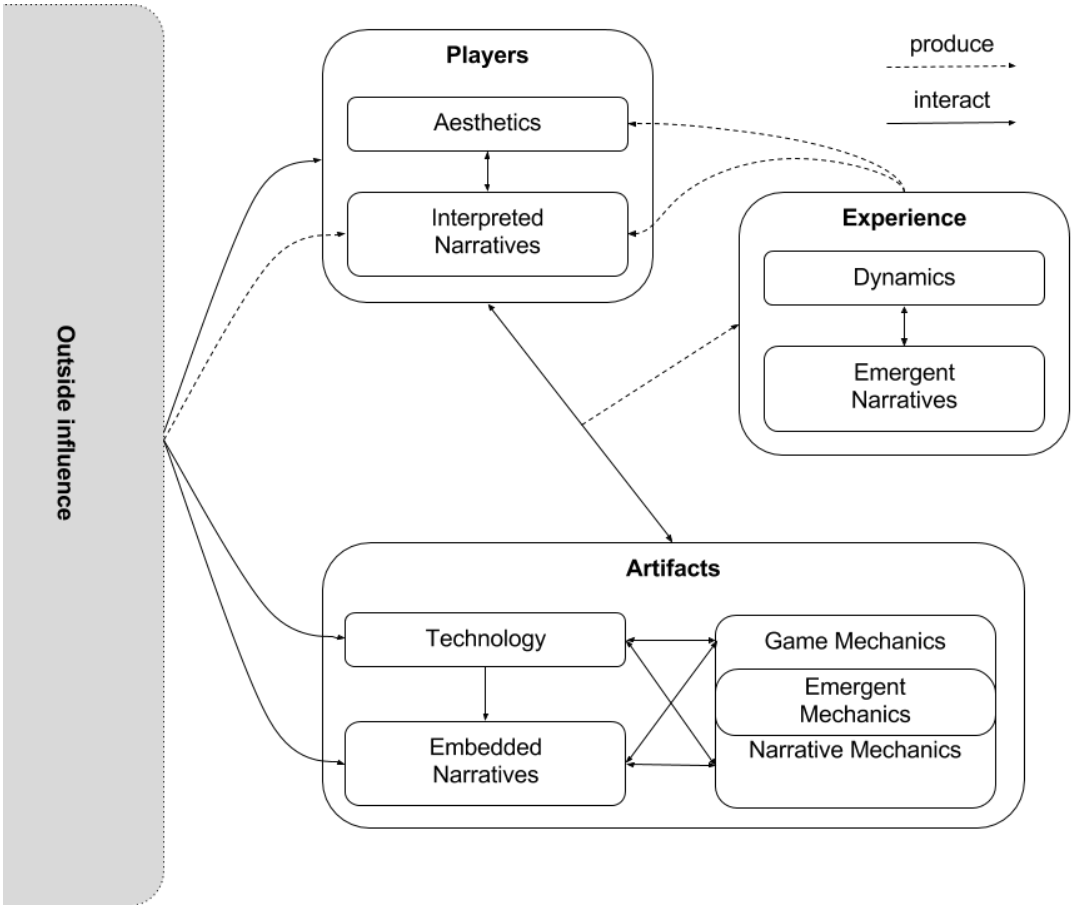


Figure 8.2 - Our suggested updated model of the Unified Theory (Ralph & Monu, 2015). Suggested in section 3.4.

Throughout the different chapters, we utilise cases from several video games to exemplify what we consider to fall within the previously mentioned definition of **Emergent Mechanics**. Categorising these elements show how the definition comprises of techniques from a wide range of fields, with everything from form interpretation, see section 4.3, to scene composition, see section 4.2. Such differences raises the issue of common language and understanding of the individual techniques, as well as individual effectiveness. The issue of common language became apparent again when we were testing the concept of **Emergent Mechanics** by introducing it to people, with different relationship to games and the game industry, through a closed Facebook group, see chapter 6. The inquiry into the validity of **Emergent Mechanics** partly transformed into a discussion of naming instead, see section 6.4.1. Many of the suggested names could efficiently be used to describe what **Emergent Mechanics** means to us, but they underline the different backgrounds that people come from when joining the discussion. It seemed like we agreed on the main functionality, but the many possible names made understanding each other confusing, because of other meanings of the same words, such as emergent, gestalt and implicit. The issues regarding naming could also be seen as an issue with the clarification of what the term **Emergent Mechanics** encompasses, as well as how the relationship is to the already defined **Game-** and **Narrative Mechanics**. In our discussion, we covered how **Game-**, **Narrative-** and **Emergent Mechanics** can be seen as a gradient, without clear borders between one another, see section 7.1. The main differentiator is the intent behind the original implementation: **Game Mechanics** are implemented because they motivate the player, **Narrative Mechanics** are implemented to offer intention and **Emergent Mechanics** are there to guide the **Experience** through the communication of concepts.

We have continuously referred to certain games, that have incorporated the concepts identified as **Emergent Mechanics**, such as Half-Life 2 (Valve Corporation, 2004) in section 3.3.4, 4.1 and 4.6, Mirror's Edge (DICE & Electronic Arts, 2008) in section 4.4 and 5.4 and Uncharted 3: Drake's Deception (Naughty Dog & Sony Computer Entertainment, 2011) in section 4.7. All of these video games have been praised for intuitive gameplay, which was

also our reason for using them as examples. For this same reason we are sure that it comes down to having well implemented **Emergent Mechanic** aspects, in addition to fun **Game Mechanics** and an engaging narrative. While we recognise our chosen name might not be the preferred naming convention depending on people's background, we still argue that the definition stands as a concept.

8.1 Suggested Future Research

In order to avoid problems with naming conventions in future data gathering, we would avoid telling the participants about the context of said data gathering. To do this we would revise our entire data gathering strategy and try coming up with a hands-on test session. This means that we would design a game prototype, with the purpose of guiding a player through an environment. Different kinds of **Emergent Mechanics** would be explored, in order to see their effectiveness on their own as well as together. To give an example of Guidance that could be used for the test, the test-participant could be presented with multiple corridors, using different emergent methods in order to pull the player towards them. The corridors could be designed with a series of vertical and horizontal lines, as seen in figure 8.3 below.

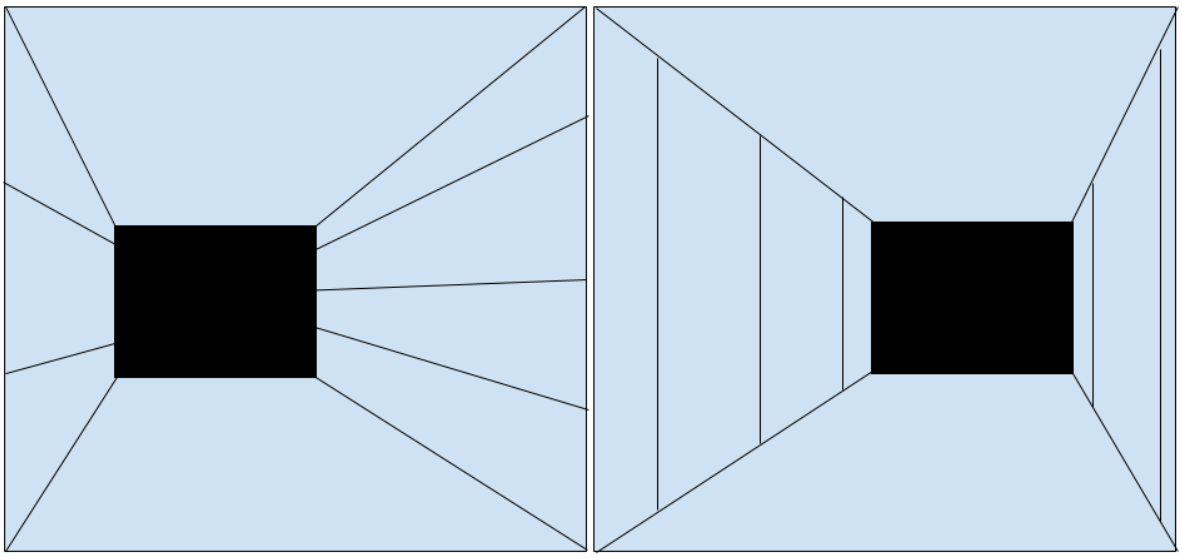


Figure 8.3 - A suggestion for putting some of the guidance elements in section 4.6 to the test.

Whenever a corridor is picked, the player will then be placed in a similar room with a choice of corridors as before, but this time a different combination of **Emergent Mechanics** associated to each. New mechanics could be a warm light at the end of a corridor or the sounds of birds chirping from inside. This way it would be possible to start mapping which Guidance elements weigh stronger than others, as well as in which combinations they do so. This way of testing would allow for measuring several Guidance elements on the same test participant, while comparing this against the participant's player type (Nacke et al., 2014). Getting more data from one person becomes increasingly important, as it would require at least 30 people, and additional an equal amount as a control group, to get a statistical significant result. Given the accessibility of the internet, we would argue that it would be easy to distribute such a test to a large audience, in the same way as BrainHex did with their approximately 50.000 participants (Nacke et al., 2014). The game could be released on an online platform such as Steam or through Unity Web Player in a browser.

Testing can be analysed using video game test software and statistical calculation programs. One to record a large amount of data on everything happening during the test and the other to piece together data and see tendencies, which might not show from simple observations or interviews. If any further help is required from the participants, then a way for opting to join future questionnaires or game tests via email could be placed within this first participation. This could serve as a test-base for any future studies both for gathering data on **Emergent Mechanics** as well as other game related studies.

The last aspect of any such testing, is making sure any findings are communicated not only to academics, but also to video game developers. Such communication can only help to further development of the medium, perhaps helping to create a common language in the process.

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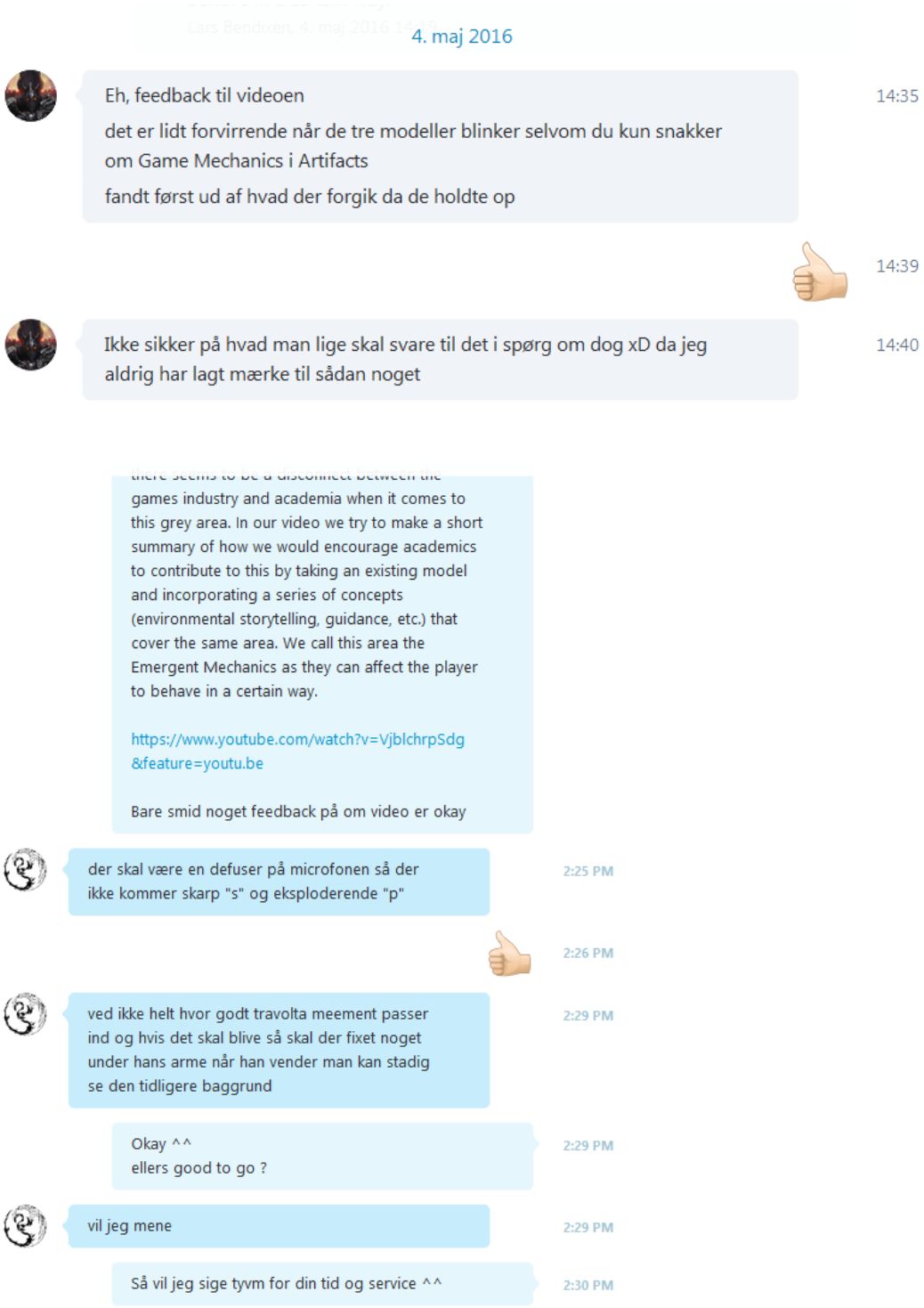
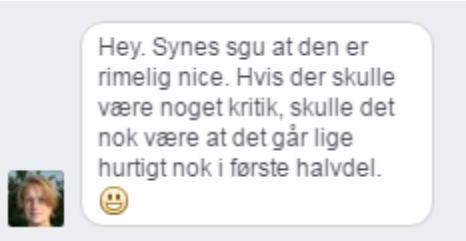
Chapter 10 Appendix

Appendix A – Pilot test





Appendix B – Online focus group answers

[redacted] Great subject! Awesome that you made a video that clearly sums up the idea.

Synes godt om · Svar · 1 · 5. maj kl. 13:40

[redacted] The first thing I began to think about, was good 'ol Mario. Level 1-1 etc. has been dissected over and over on how it first introduces elements one thing at a time in a safe way, making sure you have an idea on how to handle them in more difficult situations later on, where they are combined together, all without actually "telling" you how.
Looking a bit around, funnily enough, gave me another Game Makers Toolkit video, based on Super Mario 3D World where it's further refined.

Definitely interesting to look at! Regarding the name, can't help but to think it could be called some sort of "implecit tutorial" or "implecit mechanics", as it kinda is teaching without obviously trying to teach.

Synes godt om · Svar · 1 · 5. maj kl. 16:09 · Redigeret

[redacted] Actually this could be viewed more as gameplay gestalt. Essentially the designers create level design, narrative devices, and\or game mechanics that teaches the player different patterns. I think you should look into that, as some mentioned, emergent might not be the best word for it.

Synes godt om · Svar · 3 · 6. maj kl. 08:57

[redacted] Embedded mechanics is better. Emergent phenomena is something that is created by the interaction of a system, but that is different from the components of the system and doesn't correlate 1-to-1 to a specific part of the system.

Think brain activitiy vs thought. Related concept: supervenience.

I assume that you have read this: https://www.jesperjuul.net/text/openandtheclosed.html

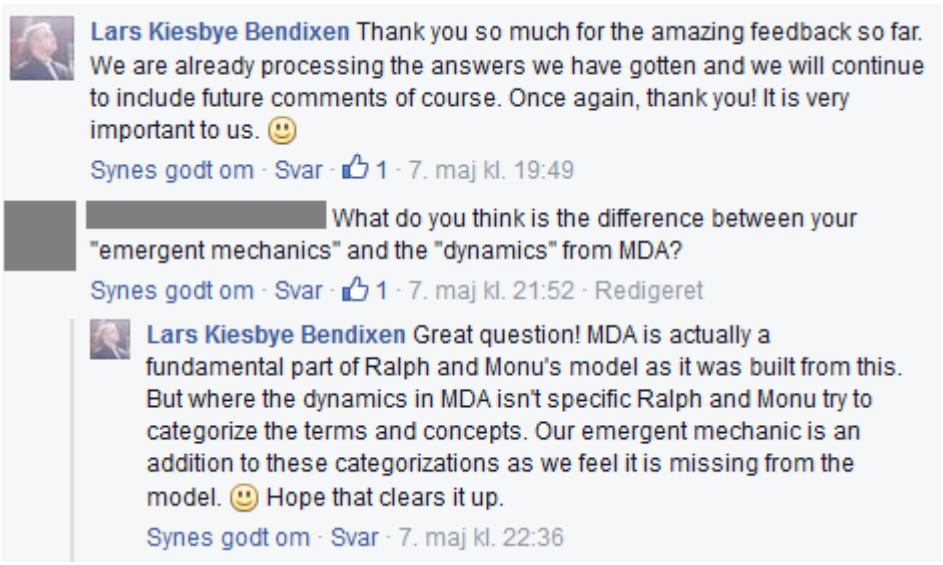
In which case your two cases - Uncharted & Mirror's Edge - is primarily "serial": If you want to deal with this types of games, you'll have to explicitly leave out games like Civilization and RTS.

Introduction to emergence as a concept: https://en.wikipedia.org/wiki/Emergence

BTW: cool video 🙂

> **Jesper Juul: The Open and the Closed - Games of Emergence and Games of Progression**
>
> Jesper Juul: "The Open and the Closed: Game of emergence and games of progression". In Computer Games and Digital Cultures Conference Proceedings, edited by Frans Mäyrä, 323-329. Tampere: Tampere University Press, 2002. http://www.jesperjuul.net/text/openandtheclosed.html
>
> JESPERJUUL.NET

Synes godt om · Svar · 1 · 7. maj kl. 18:58 · Redigeret



Appendix C – Video

See attached file: “Video.mov”.