

Abstract

In this paper narrative in interactive media is analyzed, with a special focus on emergent narrative. Based on the theory discussed, this paper details the creation of an online survey consisting of five narrative analysis methods. What these methods measure is: emergent narrative (questionnaire designed in this paper), narrative transportation, player immersion, individual game mechanics effect on emergence of narrative (questionnaire designed in this paper), and the Bartle player type. Each test subject answered the survey for one out of twenty games chosen for this research. The twenty games were chosen based to meet one of three inclusion criteria's. Firstly on their descriptive narrative, which indicates a strong emergent narrative experience, communities, secondly the emergent narrative potential and thirdly for their use as comparative or baseline measurements. The test was conducted during a three week period in May-June 2015 and the survey received answers from 14 259 people. The results strongly indicate that the emergent narrative questionnaire worked in measuring emergent narrative, when compared to the self-reported emergent narrative experience. ($P = 0.06 < 0.05$) with a strong correlation of $R(14) = 0.947$, $p < 0.05$. It is therefore assumed that the questionnaire created in this paper, worked relatively well in classifying emergent narrative based on the explanation given to the test subjects. Furthermore, the results also indicate that there is a medium and strong correlation between the emergent narrative questionnaire, and narrative transport or player immersion, $R(14) = 0.559$, $P = 0.024 < 0.05$ and $R(14) = 0.521$, $P = 0.039 < 0.05$ respectively. Narrative transport and immersion can therefore be concluded as significantly influential in games where emergent narrative is likely to appear. The amount of data gathered was great and covers a wide range of different aspects of the interactive narrative experience. Much further work is needed in order to analyze and look at this data, and we are sure there are still a number of interesting findings hiding within it.

Table of contents

Abstract.....	i
Table of contents	ii
1 Introduction.....	1
2 Background.....	4
2.1 Narrative theory	4
2.2 The Narrative Paradigm	5
2.3 Narrative Theory in Interactive Media.....	7
Can Games be Narrative?	7
Narratology vs Ludology	7
The Narrative Ingredients	8
Categorizing Games.....	9
2.4 Narrative Categorization	10
Classic Narrative Design in Video Games.....	10
The Death of the Three Act Structure.	12
2.5 Emergent Narrative	14
Emergence and the Agents of the System.....	18
Emanent Narrative	18
Descriptive Narratives	19
Goals of the System and Narrative Closure	19
The two models of Emergent Narrative	20
2.6 Emergent Narrative and the Video Game Industry	22
2.7 Emergent Narrative in Commercially Released Games.	26
2.8 Research Focus	30
Research Questions.....	30
3 Emergent Narrative Definition.....	31
4 Analysis	33
4.1 Defining Families of Games	33

Types of Interactivity	34
Segmenting of Fictionality.....	35
4.2 Choosing Games for the Study.....	36
Online Storification Processes	39
Emergent Narrative Potential.....	42
Comparative Games.....	44
Expected Baseline	45
4.3 Creating the Survey.....	46
Emergent Narrative Questionnaire.....	47
Game Mechanic Questionnaire	50
Player Immersion Questionnaire.....	51
Narrative Transport Questionnaire.....	52
Player Types	54
4.4 Research Questions	54
4.5 Null Hypotheses.....	55
5 Method.....	56
5.1 Research Method.....	56
5.2 Population and Sample Frame.....	57
Privacy Policy	57
5.3 Survey Implementation	58
5.4 Pilot Test and Changes.....	58
5.5 Conduction of Test.....	59
6 Results.....	62
6.1 Data Clean Up and Pretreatment	62
6.2 Data - The Numbers and Validity	62
6.3 Data - Scales.....	64
6.4 Data - Normality	64
6.5 Rankings	68
6.6 Results - Game Profiles.....	72

6.7	Results - PI Dimensions	74
6.8	Results - Game Mechanics	75
6.9	Results – Main Game Mechanic Scale	76
6.10	Game Mechanics - Individual Games	78
6.11	Demographics	82
6.12	Results - Correlations	83
6.13	Null Hypotheses	85
7	Discussion	87
7.1	Research Questions	87
	Primary Research Question:	87
	Secondary Research Question	89
	Additional Research Question:	90
7.2	Further Discussion and Future Works	90
7.3	Perspectives	98
8	Conclusion	98
9	Acknowledgements	101
10	References	102
11	Appendices	107
	Appendix A - Evidence of storification	107
	Appendix B - Reddit Posts	117
	Appendix C - Survey site	118
	Appendix D - Table of Game Mechanics	128
	Appendix E – Privacy Policy	134

1 Introduction

This paper details an analysis and research in interactive narrative, with a special focus on the concept of emergent narrative in interactive media and video games.

Emergent narrative is a concept of narrative which has been thrown back and forth within the narrative research community and the video game industry for the past 15-20 years. Until now emergent narrative has existed mostly on a theoretical level, but in this paper, we attempt to define and empirically measure it using our Emergent Narrative questionnaire. What we try to answer is, how to define emergent narrative in the context of video games, how it is experienced by a player and what design considerations or game mechanics are most likely to facilitate this experience.

We feel that an unambiguous definition of emergent narrative is still missing in the research community. It is also our belief that some fundamental questions remain unanswered. This question and the research gap that comes with it, is the lack of quantifiable methods which can measure the emergence of narrative in interactive media or video games. Furthermore we address, what is seen as disparity in the discussion, within the theoretical environment and within in the game industry. The two need to be linked in order to find out if the work has progressed in the right direction in either of the fields. The paper details chosen parts of the ongoing discussions and work done on the subject, and points out what we perceive as a confusion in clarification within it.

In this paper, we go on to define emergent narrative as follows:

Emergent narrative is an intrinsic experience, which transpires as a mental process, through cognitive storification or alter biographing, as a player interacts with a systematic virtual environment. As the player navigates and interacts with the game environment and ludic system, the story emerges through that interaction, either during the play session, or after-the- fact, once the player has had time to reflect on the experienced events. The story that emerges is therefore a non-scripted, self-narrated player story that gives closure, which can appear through a collaborative process between the system and the player. This feeling of closure can either appear from within the system itself, or in the mind of the player, depending on the abstract or didascalic nature of the narrative. It is a narrative, that to the player feels unique, or one of a kind. The narrative in itself does not have to be one of the kind, but the system needs to be complex enough for the player to experience it as such.

Introduction

Or in short:

Emergent narrative is created, internally by the player, as a non-scripted self-narrated player story that gives closure.

In order to measure emergent narrative, video games that are perceived to offer emergent narrative, and released in the past five years, were sought out. This was done by looking online for apparent accounts of storification processes, where players felt a strong enough urge to retell their gaming experiences in the form of stories. Seven such communities were chosen, with 13 additional games picked, based on either their emergent narrative potential, or to be used to form a comparative baseline.

Using our definition of emergent narrative, and following our discussion and analysis of the subject, we designed a ten question Likert scale survey that would measure emergent narrative. Then, considering the game mechanics of all the games chosen we created a list of 26 game mechanics which fit within the systems of these games. Based on that, a 4-12 question survey with game specific questions, relating to each game's mechanics was created. The questionnaire also asked players to report on if they felt they experienced emergent narrative, based on our definition. The test subjects were then asked to rate the individual mechanics based on their perceived influence on the narrative experience.

Additionally, based on research indicating that narrative transport and player immersion being important aspects of emergent narrative, the survey included two questionnaires which analyze the narrative transport and the player immersion experienced while playing these specific games.

All in all the survey consisted of four different analysis methods, where depending on the game. A total of 56-65 questions were asked.

Lastly a non-compulsory analysis was added, in order to gather data on the player types of the participants. The test used was a Bartle player type test, which is an online questionnaire consisting of 30 questions.

Each participant answered the survey for only one of the twenty games, with a few going back and re-taking it for a second game. But because of what is considered to be caused by the length of the survey, only 70% of those that participated completed all four main questionnaires, with 39% answering the optional Bartle test. Answers were saved after each section, so the different questionnaire received a different amount of answers. The survey was conducted over the course of three weeks, from the end of May into the middle of June, 2015.

Introduction

13 547 people answered the emergent narrative questionnaire, 11 678 the Narrative transport, 10 146 the Player immersion and 9438 answered the game mechanic questionnaire. Additionally 5220 people answered the optional Bartle test.

The results indicated that there is a correlation between the emergent narrative questionnaire and narrative transport or player immersion, 0.559 and 0.521 respectively. This indicates a medium to strong correlation. Because of the lack of lower numbers for comparison, the only thing that can be concluded is that games containing highly emergent narrative, do contain in most cases, a relatively high level of immersion and narrative transport.

When looking at the results from the game mechanic questionnaire, it is indicated that in the chosen games, the top five, self-reported, most relevant game mechanics would be Empire management, Permadeath, PvP interaction, Random world, and Diplomacy. Although these results were pretty clear, they do not indicate anything other than the games being chosen and rated highest on the Emergent narrative scale, are more likely to contain the more emergent game mechanics. This emergence of narrative will, therefore always come down to the systems design and implementation, as long as the game sticks to ontological design methods.

On the other hand, the emergent narrative questionnaire, based on our results, did manage to pinpoint the more emergent games, when comparing it to a self-reported narrative experience, with a correlation of 0.947.

The amount of data gathered can in itself be seen as one of the better results of this paper, with approximately 680 000 individual questions answered. With this amount of data, and with its wide range of questions. The data set could become highly valuable to the field of video game and narrative research, and could serve as a foundation for much further research in the field.

2 Background

Narrative theory has evolved through the birth and evolution of books, movies and hypertext media. Today, these methods of analyzing stories have taken a new turn with the introduction of interactivity. How has narrative changed and evolved with interactive media, and what are the different ways of presenting stories in games?

To start off, we are going to detail some of the history of narrative theory and research, introducing relevant concepts and discuss their relation to the topic of this paper. Firstly we will be taking a look at the beginnings of narrative theory. After this, a closer look will be taken at how the introduction of interactive media has affected the field, and introduce the concept of *emergent narrative* and other related topics.

One important term that needs to be specified to begin with, is what narrative theory calls “the reader” and in the context of video games, “the player”. In both cases it means the recipient that experiences the content of the story or the game. In this paper, both these words will be used, interchangeably. If a reader is mentioned in relation to a game, it means the person playing the game and experiencing it and its story.

2.1 Narrative theory

Literary theory or narrative theory proper begins with the Russian Formalist', represented by Viktor Shklovsky and Vladimir Propp, but it can trace its roots back through history to Aristotle's Poetics (Aristotle. and Rackham, 1934).

Shklovsky's research into the relationship between the composition and style of stories in the *Theory of Prose* (Shklovsky, 1925) and Propp's *Morphology of the folktale* (Propp, 1928) are considered some of the ground stones of the Russian Formalists' way of analyzing stories. This movement or school of thought, was continued and evolved by for example, the French scholars, Lévi-Strauss and Barthes and by the linguistic circle The Prague School and focused almost exclusively on poetic literature.

However in the late 19th century, the popularity of the novel, gave rise to a need to include this new form of narrative in the theory. The defining difference, between poetic literature and the novel, was the narrator of the story. In traditional poetic literature, the narrator is the author or, at the very least, there is no difference between the author and the narrator. Yet in the novel, many characters can be included which makes it possible for the story to contain contradicting views and beliefs, and more importantly the view of the narrator could differ significantly from the author's view.

Background

This led to a debate on the characteristics of the narrator, resulting in different types of narrators being defined. In *Narrative Discourse: An Essay in Method* (Genette, 1980), Gérard Genette gives us the, now, classic narrator types, First Person, Third Person and Omnipotent.

Although the original narrative theory was created to analyze poetic literature, it survived the addition of the narrator from the novel by being updated to include a new form of text. Just like narrative theory adopted a new form of text, new and other media have been adopted by narrative theory. We see this in the evolution of narrative theory used in theater, film and, more recently, hypertext.

The newest medium to emerge, is that of the video game. When this medium was introduced, it opened up the discussion on whether or not a computer game can be perceived as narrative, and how to apply the narrative theories onto digital, or computer, games. The real difference between the narratives of the traditional theories and the narrative as presented in computer games is the introduction of interactivity. It potentially allows the reader to have agency on the story and be involved in the creation process, as well as have an influence on the outcome of events. Of course the amount of interactivity provided varies a great deal, but the crucial aspect is that they generally give the player the ability to interact more deeply with the story than for example a hypertext would. Whether the story being presented is a completely linear narrative, some form of branching narrative or a more complex system of narrative, a reader or player of a computer game, will be in the middle of it and hence experience it as both narrator and a participant in the story of the narrative.

2.2 The Narrative Paradigm

When trying to introduce interactivity into narrative theory, the question about who holds authorial control at any time during the narrative experience is raised. In 1984, Walter Fisher proposed the narrative paradigm to explain how human beings experience and make sense of any series of events as ongoing narratives, and how all meaningful communication is done through storytelling. (Fisher, 1984) It is our belief, that the aforementioned introduction of interactivity to a narrative medium can, in its stronger forms, trigger the cognitive process of the Narrative Paradigm. This way of internalizing our lives is also a phenomenon explained in psychology. According to narrative identity theory, this narrative development starts when we are children and the way it evolves is influenced by our communication with friends and family, as we grow older. (Hoyt and Pasupathi, 2009)

This process is very similar to Storification as put forward by Ruth Aylett in 2000. According to her, Storification is the self-narration process of a person's life, which is subjective and individual (Aylett, 2000),

Background

different people will have different stories to tell, based on their beliefs and experiences. We, as human beings, will sometimes, start logically connecting events in our everyday lives in order to create a coherent whole, or a story. Stories are also one of our most widespread form of entertainment and communication. (Aylett, 2000) Marie Ryan iterates on this process when she says that almost all human interactions can have a storytelling or narrative aspect to it. It is therefore possible to look at narrative as a cognitive act, ingrained into the human experience. A mental construct we use to interpret and understand behavior and aspects of other people, or even interactive systems. (Ryan, 2006)

“Life can only be understood backwards; but it must be lived forwards.” (Søren Kierkegaard)

Or as Ryan coins the term:

“Life is lived looking forwards, but it’s told looking backwards” (Ryan, 2006)

This concept of storification, can be translated into alter biographing, or the creation of an alter ego. Where a person projects its own identity, onto an imaginary person, or alternate personality. One that shares feelings and beliefs in most things with the one imagining it, but whose situation is somehow different. Not unlike imagining your own future self, daydreaming or identifying with a video game character. (Wilson, 1991)

What both Aylett and Ryan are, in essence, explaining, is the cognitive process defined by the Narrative Paradigm, therefore we will use the term *storification* in this paper to refer to the cognitive process which happens when a reader internalizes and creates a story out of what he experiences in an interactive medium.

But how can this cognitive process be measured? Once a personal narrative is written down, it is no longer in the ownership of the author, but becomes understood and interpreted by its audience based on their shared knowledge and experiences. (Young, 2013) This is one of the main elements that makes storification a hard subject to measure. As soon as a story is told, written down or expressed in any other manner, it will always change. This change can be affected by the storytelling methods the author possess, his way of writing or choice of language. But the story is also affected by the interpreter, who will project his own experiences and cognitive methods into understanding the narrative. Implicitly analyzing or recounting the core story of another person, is therefore unmeasurable and ultimately impossible. On those lines, a story experienced by a video game player will remain a story in the player's mind until he finds the need to discuss or retell the story. The actions and events that we encounter (Adams and Rollings, 2010) (Aristotle. and

Rackham, 1934) (Aylett, 1999) will be experienced and it is not until we try to retell them that they turn into narrative.

2.3 Narrative Theory in Interactive Media

Saying that all actions taken in a game, or in life for that matter, will become meaningful stories is counterproductive. (Aarseth, 2004) There needs to be some kind of a measure on the narrative experience, and if internal narrative is unmeasurable, how can we see if different games offer different forms of narrative experiences. Marie Ryan agrees with this in *Avatars of story*, where she says that:

“A trans medial definition of narrative will require a broadening of the concept beyond the verbal, but that this broadening should be compensated by a semantic narrowing down, otherwise all texts of all media will end up as narrative.” (Ryan, 2006)

Can Games be Narrative?

But can games really be narrative in nature? There has been a lot of debate on that subject throughout the history of research in the medium. In her book, *Avatars of story* Ryan states:

“Every medium capable of narrative presents its own affordance and limitations; why, then, couldn’t video games present their own repertory of narrative possibilities?” (Ryan, 2006)

A statement which Gordon Calleja agrees with, in his 2009 paper *Experiential Narrative in Game Environments*.

“Game environments have reached a sufficient level of sophistication that not only allow, but demand, a redefinition of classical notions of narrative.” (Calleja 2009)

Narratology vs Ludology

The debate about whether or not games can be seen as narrative in nature took a great deal of time and energy away from the research community, where people debated on how to classify games as one thing or another. It is understandable why some researchers would want games to be an independent research

medium. A medium free from the theoretical restrictions imposed by topics like literature or narrative methods. But the two do not have to be mutually exclusive, and could possibly be seen as two sides of the same coin.

The discussion was at its heaviest during the early 2000's between the camps of ludologists and narratologists, but has since been put to rest. (Murray, 2005)

In this paper we do not aim to participate too strongly in that discussion, but identify with those that think *some* games can indeed offer a narrative experience, both linear narratives, and more emergent types of narrative.

In this paper, games are seen as a medium which has a great potential for narrative when designed with specific considerations in mind. But saying that all games are narrative and that all games can contain stories is counterproductive. What needs to be looked at are the nuances and experiences that the player has, what makes him perceive and experience the game as narrative and how these experiences are different between games.

The Narrative Ingredients

Ryan mentions how games have the basic ingredients needed to create a narrative. Those ingredients are characters, events, settings and beginning and end states (Ryan, 2006). But again, not all games will include all these ingredients, it will always come down to the purpose and design of that specific game. Comparing games interchangeably is therefore a problem which seems to emanate throughout narrative research in games. Looking at games only from a ludic perspective, based on their game mechanics simplifies matters but when it comes to comparisons between them, it could be seen the same as comparing TV advertisements to Hollywood blockbusters, as the same narrative medium. In some forms of analysis, that might be the most sensible thing to do, but in the context of form or narrative creation, the same rules might not apply.

Games can be abstract or simulations and all in between. Tetris, chess and many of the earlier arcade games can be seen as abstract constructs which do not model anything outside themselves, while other games can be seen more as simulations that will depict something external (Ryan, 2006). If asked, anybody could tell you a story about any game. Janet Murray argues in her 2004 paper: *From game-story to cyber drama*, that all games are narratives, no matter how abstract they are (Baetens, 2005). But Ryan argues that retellability, at its base level, is not enough for a game to be considered a narrative, but rather she goes on to suggest an important *middle ground*, between games that do not offer narrative and all actions in games, being classifiable as narrative. (Ryan, 2006) She looks at narrative as a scalar value where:

Background

“The greater our urge to tell stories about games, the stronger the suggestion that we experienced the game narratively. “(Ryan, 2006)

People will apply different levels of storification to games, depending on the nature and system offered by a game. Games, as a universal term, can therefore not be discussed as entities with the same definition but rather, they need to be defined based on their narrative potential. In this paper it is the intention to look at narrative from the same perspective as Ryan calls “the middle ground”, or by looking for games that trigger the strongest urge to re-tell your experiences, therefore indicating a strong narrative experience.

Categorizing Games

“The practice of formulating theoretical and analytical frameworks that are meant to be applied to “games” without taking into account the fact that the various media objects referred to have radically different qualities. Using the blanket term “game” to refer to anything from a game of physical football to the computer based Bejewelled, Grand Theft Auto IV or World of Warcraft undermines analytical accuracy.” (Calleja, 2009)

First of all, it must be said that computer games, no matter which computer platform it is created for, are very diverse and at times very complex in nature. Many have attempted to classify between the core of games, both digital and not. One way is to create wide reaching definitions that covers a breadth of different game types, usually including both digital and physical games. While this can be a good approach, because it allows the definition to be applied to many games and theories, it also has the weakness of not getting all details of the games incorporated. This can then lead to unequal comparisons or other uncertainties. An important aspect that we find must be present in a computer game, is that it must be ergodic. It must be a non-trivial exercise to play the game, otherwise it would more a film or movie than a game.

Calleja uses a suggestion from Ludwig Wittgenstein (Wittgenstein, 1953), that proposes, instead of using a universal definition, to use a categorization system, that divides games into families of game. Each of these families would then contain the games that share “*family resemblances*” and would not be a set of strict rules but rather a grouping of games that together represent a collective concept. The strength of this method is that there is no single list of characteristics that all the different types of games must follow, while still allowing all details to be mentioned and used. Of course this method is not perfect either; it

requires that boundaries be drawn by anyone wishing to analyze the games and the researcher must be aware that these boundaries are artificial and could be subject to discussion.

We are of a similar mind, in relation the definition of games, in this paper. Therefore we will be identifying different families of games in the Analysis Chapter, based on what we perceive as their appropriate placement within our categorization.

2.4 Narrative Categorization

How can you analyze the narrative experience in video games? One of the new nuances of interactivity is that it requires new ways of thinking about narrative structure. In some cases, designers relinquish their rights as the author and hand the torch over to the „reader“ or in the case of video games, the “player”. This emerging media has now started creating emergent narrative, or experienced narrative; where the readers becomes the creator of their own story. This chapter's intention is to list the different narrative methods already used in video game development, and in the end put a special emphasis on emergent or experienced narrative.

Classic Narrative Design in Video Games

Narrative in video games has taken many storytelling methods from the more traditional types of narrative theory. One of the most distinct ones would be linear narrative, represented in figure 1. Linear narrative takes the same form as a story presented in a book or a movie. The story is told from start to finish, it has a beginning middle and an end. The chronological placement of events does not need to be in order but rather they tie together as a whole to create a single stream of narrative.

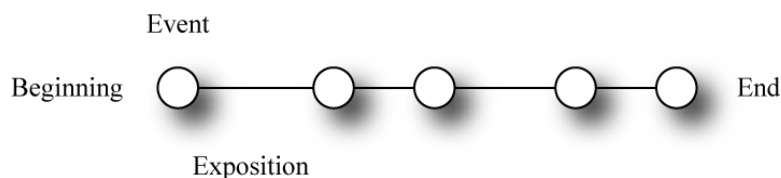


Figure 1. Representation of the linear narrative structure

The structuring of this narrative can then be manipulated into something that will have the biggest effect on the reader. This structuring of the story has been worked and reworked since the days of Aristotle and

Background

can be explained as Protasis, Epitasis and Catastrophe or beginning, middle and end. It can be shown in its most basic form with the Freytag triangle (see figure 2), developed by Gustav Freytag in the 19th century. (Freytag and Dilthey, 1965)

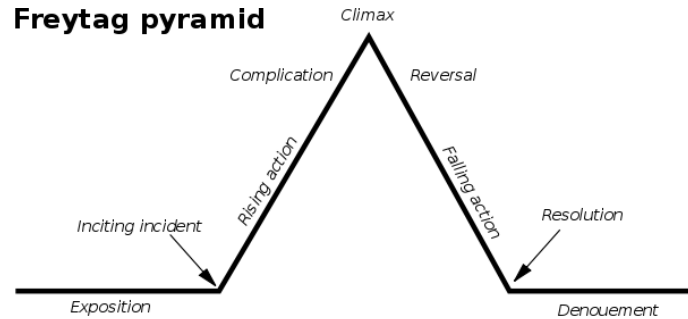


Figure 2. The Freytag pyramid

But with the introduction of interactivity the player can be given power over the path or direction that the narrative takes. This was first seen in the so called adventure books, where readers could make decisions on what their character would do by moving to a particular page depending on their decision. In games, these branching structures of narrative, sometimes offer a player choices that will lead him down different parts of the potential story, excluding the parts of the story that do not fit in with his choice. There exists a wide range of narrative design methods (see figure 3 – 5) that can be used to create these interactive structures. Ryan defines nine such methods in her book, *Narratives as virtual reality*. (Ryan, 2001)

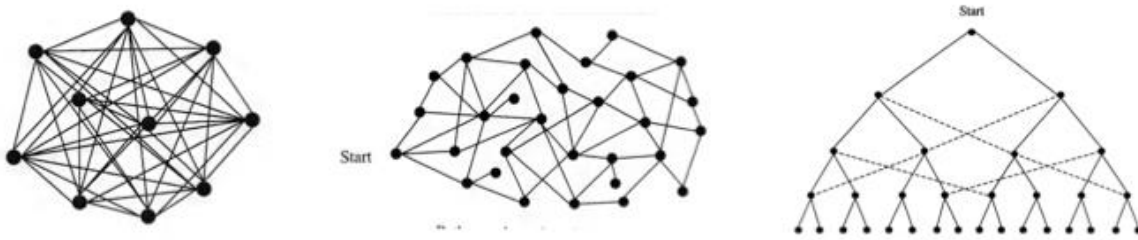


Figure 3. (1) The Complete graph structure, (2) The network structure (3) The tree structure

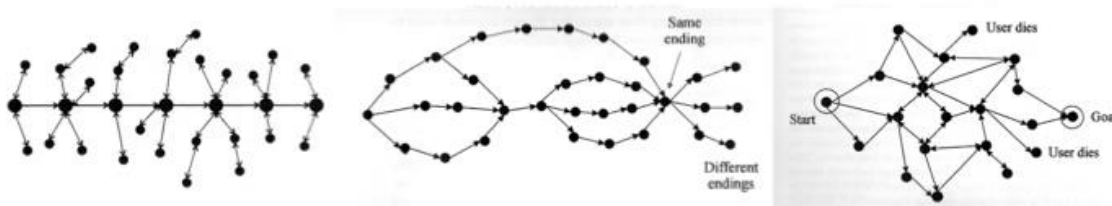


Figure 4. (4) The Vector with Side Branches (5) the Maze Structure. (6) The directed network or Flow chart

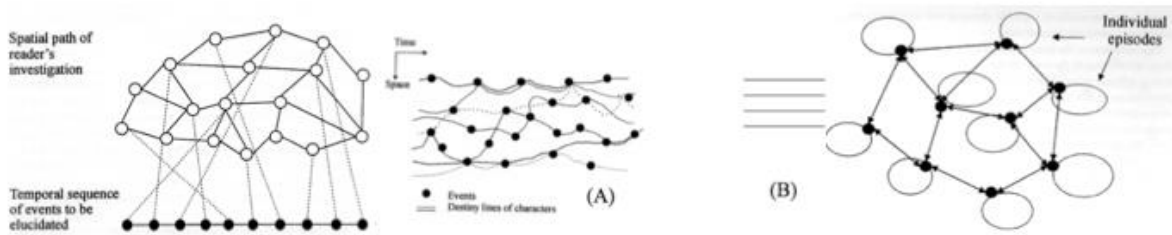


Figure 5. (7) *The hidden story*, (8) *the braided plot*, (9) *action space, epic wandering and story world*.

As can be seen there is a range of possibilities in the design of interactive narrative, some fit within linear narrative games, others within the branching type of narrative. Where the player gets to make choices in the progress of the game (the tree and maze structures being the most straightforward examples). Some of these methods have been known to cause the rise of the narrative paradox or the combinatorial explosion. The narrative paradox, is a theory which seems to have been first publicly coined by Ruth Aylett, explains interactivity and narrative cohesion as being in tension, and she says that a structure of a narrative is affected and disrupted by any user additivity or interaction, leading to possible incoherence as the system accounts for that interaction.(Aylett and Louchart, 2003) An example of that would be when the pre-scripted narrative and the interactivity offered to the player start clashing, causing friction between the player and the story that the designer wants to project. In the more branching narratives, you could face the problem of the combinatorial explosion (Stern, 2008) where every decision branch you add is another line of narrative that needs to be written and designed. For each choice you give, new content and dialog needs to be designed cascading into the infinite. A way around that would be something like the maze structure shown in figure 4, but the problem here being the deceptive agency given to the player, where the choices have no real effect on the solution or ending of the story.

The Death of the Three Act Structure.

In a Game developers conference talk from 2014, Richard Rouse from Microsoft game studios and Tom Abernathy from Riot games talked about the use of some of these different narrative structures in games. They talked about how the classic narrative three act structure has evolved in storytelling over the past thousands of years. It has been theorized and re analyzed countless of times in striving to find the best storytelling methods, if not for all stories, then at least for specific mediums. (Abernathy and Rouse, 2014)

More complicated story structures can be found in an abundance, but they all follow this basic principle. The more linear story structure has been used to great effect in games like *Uncharted*, which is considered one of the “movies” of the gaming industry, mainly because the story is completely linear, and the player

Background

has no choice in the way the story evolves, only in how he tackles the gameplay moments in between the cut scenes. This is not necessarily a bad thing, but if you want to develop an open world game, using any of the classic linear structures becomes hugely problematic. Some of the biggest open world games still apply some kind of linearity to their progression. Fallout 3 (Fallout 3, 2008), and Skyrim (The Elder Scrolls V: Skyrim, 2015) for example. In both games the player has a choice of when to follow the linear missions, and in between he can explore and discover all kinds of interesting side missions and activities. But in order to finish the game he will always be forced to get back on track and follow the main plot points put in there by the designers. This creates an experience gap for many players who do not like this way of being forced to play the game, or what was earlier referred to as the narrative paradox. Abernathy and Rouse, say that these open ended game worlds are what “story gamers” prefer, because in between the linear plot elements lies the emergent narrative of their own creation.(Abernathy and Rouse, 2014)

In the talk, they mention a study done in 2012 where it was discovered that players do not remember specific plot points of games, but are able to remember their own user experience, and specific game characters in great detail. It seems to be that the gap between plot points, where players spend most of their time exploring and playing, is causing them to lose interest in the story. (Abernathy and Rouse, 2014)

Another interesting fact from that study, is that most gamers do not finish the games they play. So all that money and effort put into the writing and creation of a games story, not to mention if it is a branching story, where it will never be seen in its entirety by half of the players.

Game Name	Average completion
Walking dead S1 Episode 1	66%
Mass Effect 2	56%
Bioshock Infinite	53%
Batman: Arkham City	47%
Portal	47%
Mass Effect 3	42%
Skyrim (main quest)	32%
Borderlands 2	30%

Table 1. The table shows a number of linear narrative games and the completion rate of its players (Abernathy and Rouse, 2014)

All in all this goes to show how linearity and using the three act structure (Seen in figure 2) might not always be the best choice for game developers, but rather that they should expand their possibilities in how to structure their narratives. One such worthy consideration is the concept of designing for emergent narrative.

2.5 Emergent Narrative

The concept of emergent narrative has been making its rounds in the interactive narrative discussion for around twenty years; in 1995, Tinsley Galyean offered what is considered the first account of emergent narrative in connection with interactive media.

“We all construct narratives out of our daily activities to help us remember, understand, categorize and share experiences. It is this skill that many interactive systems exploit. They give us environments to explore. We, by combining the elements of these spaces with our goals (the user’s goals), allow a narrative to emerge. If any narrative structure (or story) emerges it is a product of our interactions and goals as we navigate the experience. I call this ‘Emergent Narrative’”. (*Galyean, 1995*), (*Walsh, 2011*)

Later, in 1999. Ruth Aylett, who by many is considered one of the leading authorities on emergent narratives, theorized about the topic as well. In her paper *Narrative in virtual Environments – Towards emergent narrative*, Ryan compare emergent narrative in interactive media, to the way narrative emerges in human life. The comparative examples she mentions, are for example story that emerges during a football match, where the individual's emergent story will be affected by, for example, their inclinations towards one of the teams, the current standing of the team, or which players get to participate in the match.(Ryan, 2006)

She goes on to mention how narrative emerges in other mediums such as improvisational theater or reality Tv shows, where people, conducting themselves within certain rules or boundaries, will participate in the creation of emergent narrative, based on the input or actions taken by them, the audience or the other actors. This is a comparison which Ryan has also used in her discussion on interactive narrative where she echoes the question, if narrative can emerge in other mediums, why shouldn't it emerge in interactive systems or video games? (Ryan, 2006)

Background

Aylett sees emergent narrative as one the possible solutions to the narrative paradox, where if the narrative structure is created through the interaction, and not only affected by it, the likelihood of narrative structural problems arising from that interaction, diminish. (Ryan, 2006)

Still, the actual definition of emergent narrative and how it is created seems to be a bit more obscure subject in the theoretical environment. Many scholars have created their own definitions of the subject, some of which will be mentioned here.

In 2003 Aylett and Louchart iterated on their definition of emergent narrative, defining it as something that will try to capitalize on the entertainment values of discovery, interaction and immersion. Something that is developed in the belief that the player can, by interacting with virtual agents and actors, participate in the emergence of narrative that would be both coherent and satisfying as an experience on an individual level. (Aylett and Louchart, 2003)

This definition suggests that emergent narrative is something created within the system and within the player at the same time, where the player will, through exploring and interacting with the system, participate in the creation of a narrative as a secondary or co-author.

Five years later, Aylett and Louchart, during the process of creating an emergent narrative system, explain what this kind of system would entail. An emergent narrative system should be designed to be able to offer a dramatic experience to a user. The user, by taking a given role, would take on the responsibilities of the interactive aspects of the experience. The only way for a narrative to be created in the system, is for the participator to actively participate, where he has been given the means to affect the narrative environment and the characters that populate it. (Louchart et al., 2008)

The same year, Aylett released another paper where emergent narrative was defined yet again:

“Emergent Narrative refers to a form of interactive storytelling, where the narrative is built bottom-up from interactions of characters. Like in any other emergent system relatively simple local decisions lead to complex behavior.” (Kriegel and Aylett, 2008)

Background

Kriegel and Aylett graphically explain emergent narrative as a three dimensional narrative landscape where a story experienced equals a specific path taken through a landscape where the reader can travel as he pleases but will encounter narrative peaks or suspenseful actions. See figure 6 (Kriegel and Aylett, 2008)

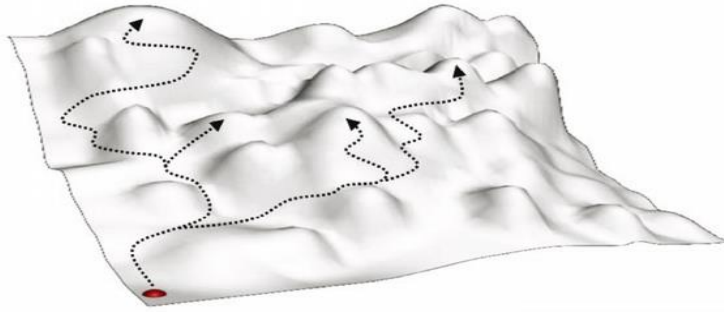


Figure 6. Kriegel and Aylett's graphical explanation of emergent narrative. (Kriegel and Aylett, 2008)

Around the same time that emergent narrative was mentioned in the research community, the game industry started expressing an interest in it as well. First mentions that could be found, were made by Marc LeBlanc at the 1999 GDC (Game developers Conference) in San Francisco. (Salen and Zimmerman, 2003) LeBlanc said that games could contain two types of narratives, embedded or emergent. He went on to explain emergent narrative as retold by Ernest Adams in his book *Fundamentals of Game Design* (Adams and Rollings, 2010).

The story emerges from the act of playing. There is no separate storytelling engine and no preplanned story structure, either linear or branching; in principle, anything can happen at any time so long as the core mechanics permit it. Refers to storytelling produced entirely by player actions and in-game events. (Adams and Rollings, 2010)

LeBlanc also talks about embedded narrative as the other possibility for narrative in computer games. Embedded narrative can be any pre-created narrative that already exists within a game before the player interacts with it. This could be story content, linear or otherwise, the environment and most other things placed within the game world. (Salen and Zimmerman, 2003)

Other people have defined emergent narrative as well, and now it seems to be reaching a more stable platform of explanation. According to Henry Jenkins, Emergent narrative is not pre-structured or preprogrammed but rather, it takes shapes through the game play. Within this game world or authoring environment, the players can define their own goals and write their own stories. When game spaces are

Background

designed to be filled up with narrative potential, and the possibility to interact and affect the game world, it enables this emergent story construction activity for players. (Jenkins, 2004)

The list of people that have defined emergent narrative goes on, (Fullerton, Swain and Hoffman, 2008), and more have in their writing created their own definitions of emergent narrative. Although these definitions generally stem from the same sources, they all somewhat differ, while trying to keep the same logical grounding. One common problem that can be seen throughout the literature and the different online discussions is the lack of distinction between what is called emergent narrative, and that of emergent gameplay.

Emergent gameplay is a much more accepted term in video game discussions, and could be explained as the emergence of gameplay or actions when a number of different game mechanics affect each other in unexpected or interesting manner. Our view on emergent gameplay is that although these moments can be highly enjoyable, and can participate in the creation of emergent narrative, we do not see these instances in themselves as narrative, but more as anecdotal events that happen randomly within the game's system.

Some of the focus of the narrative community is on creating and analyzing character based emergent narrative. There, the focus is on creating and designing intelligent narrative systems or A.I. which will be able to react to player input to create narrative through the interactions of the player and an autonomous agents. Although a very interesting subject, we think that emergent narrative can, and is being created, outside of the character based narrative structures.

In her discussion of narrative modes, Ryan also has her own definition of emergent narrative. In her emergent mode, discourse at some aspects of a story are improvised by the narrator or by actors, by the player or through procedural creation. She talks about subcategories of emergent narrative which are first participatory narrative and then narrative that emerges from simulation. In the participatory emergent narrative, the actions of the player or the recipient is what creates or actualizes the narrative. This can happen as either discourse or story level participation. In discourse participation, the reader, or user is allowed to determine the order of presentation of the story (hypertext fiction), while in story-level participation, the user gets to impersonate or act as a character in the story world. This impersonation will then influence the progression and evolution of the story (pen & paper roleplaying). She also mentions simulation as another narrative mode, where simulation, is seen as a narrative engine which generates content based on the input of the user using a combination of fixed and variable parameters. This simulation mode of narrative, is specific to digital media and computer games. (Ryan, 2006)

Aylett and Loucharts later work has focused on character interactions and how emergent narrative is created in tabletop roleplaying games or Dungeons and Dragons (D&D), and improvisational theatre. In these tabletop role playing games, the players, with the help of a game master will create intricate, emergent narrative stories through their conversation, confined within the D&D rules being used. In their 2004 paper, Emergent narrative, requirements and high-level architecture (Louchart and Aylett, 2004), proposes a list that is highly focused on character design and interaction, which details what is required of a narrative or a system to be considered an emergent narrative. The emergence, she and others are creating, focuses on the narrative being created within and by the system, where the user can direct and influence the storytelling being done within it. But we want to take a step back and work from one of Aylett's own earlier quotes:

Character-driven emergent narrative is not the only way of tackling the issue — in simple cases event-driven narrative can be produced assuming that the agents have a suitable repertoire of behaviors. (*Aylett, 2000*)

Emergence and the Agents of the System

One of the considerations here, is what would constitute an agent. One explanation could be that an agent would be a character within the narrative environment, and through interaction with that character, narrative plot lines could emerge. But we want to see agents as the elements of simulation, where the narrative engine that generates content based on the user's input, does not have to be necessarily character driven. We rather see it as mix of a number of game mechanics that with a mix of emergent behavior, emergent gameplay and user reflection can create emergent narrative within the mind of the player themselves, and not only within the system. We think emergent narrative is created as a symbiosis between the system, and from within the mind of the player himself. A narrative based on decisions and considerations, made out of the game world, combined with actions taken within it.

Emanent Narrative

Gordon Calleja, is aware of the previously discussed over generalization and difference in clarification of emergent narrative, and in his writings he attempts to break away from the confusion by creating a new term. A term he calls experienced or emanent narrative. As he explains it, emanent or experienced narrative refers to the ongoing interaction with the game environment which generates a story in how the player interprets the events that occur in the virtual environment. The player's interaction with the rules of the system and the different entities that inhabit it, human or AI then combine with the process of play to create these stories. In his words:

“Interaction generates, not excludes story.” (Calleja, 2009)

Descriptive Narratives

In the process of creating his framework, Calleja suggest the focus on narrative experienced by players that are actively engaged in the game, but the exclusion of secondary narratives, or as Celia Pearce names them, descriptive narratives. Descriptive narratives describe the retelling of game events to a third party, and the culture that can emerge out of that re-telling. (Pearce, 2004) Calleja, does so because he would like the narrative framework to distinguish between the narrative experienced by a player actively engaged with the game and the narrative that is produced after-the-fact through re-telling the story. Calleja goes on to say that these after-the-fact stories in themselves depend on the original narrative and can be largely distorted by the person retelling them. (Calleja, 2009)

When creating a narrative framework, leaving out any descriptive measurements which could become distorted upon further inspection, seems logical. But what Ryan said about a stronger narrative urge, suggesting stronger narrative experiences, could be valuable when it comes to pinpointing interactive systems for further analysis. Descriptive narrative can therefore be used to assess and locate these games that are more likely to include a strong emanent or emergent narrative. This will be elaborated on further when it comes to choosing the most appropriate games for this research.

On another note, although we agree with the statement that a framework specifically analyzing the narrative within the game environment, might not need to include any after-the-fact or extrinsic descriptions, we think that the after-the-fact or descriptive narrative is an important part of the emergent narrative experience. The intrinsic narrative a player might experience within his own mind, might get lost, if an extrinsic method of retelling is left out of any analysis. Or in other words, a player experiencing a number, of what might seem to be unrelated events, or emergent gameplay moments, could be prone to see those events as a connected whole or a story after finishing his play session. The retelling of those events would therefore be his only measurable way of expressing that story, and the only way for research to access and analyze it. This causes a problem in any research which would try to locate and analyze such an intrinsic experience, and is something that will be elaborated on further in the design of an emergent narrative questionnaire.

Goals of the System and Narrative Closure

One of the requirements for descriptive narrative is that the player actually has a story to tell. This leads us to two terms, proposed by (Bruni and Baceviciute, 2013); Narrative intelligibility and narrative closure.

Bruni and Baceviciute are proposing a framework that can measure what they call the Author-Audience Distance (AAD). It is a measure of the gap in interpretation between the author of a narrative and the audience that receives the narrative. It is a function of the narrative intelligibility, which in turn is defined in relation to the narrative closure of a text. The two terms, narrative intelligibility and closure are both processes that occur when an audience is receiving a narrative. Intelligibility is the process that happens when an audience interprets the narrative close to what the author intended. And closure is a “*process where the audience may construct its own meaning out of what is being mediated, independent on whether that meaning corresponds or gets close to what is intended by the author.*”

They go on to talk about the need for the goal of the system to be defined or rather it should be determined if it is the goal of the system (Narrative closure) or the goal of the narrative (Narrative intelligibility) that is in focus, in a given interactive narrative system. If narrative intelligibility is not the goal of the system, that is, if the purpose of the game is not to tell a specific story, created by the authors/developers of the game, it still possible to experience narrative closure.

They state that it is important to place closure on one of two levels: the level of the system or the level of the embedded narrative. Closure at the system level is usually experienced as meaningful interaction that may result from interactions that are independent of the author and the goal of the system. At the embedded narrative level, closure “*entails a good sense of having experienced a narrative, which, however, does not necessarily coincide with the author’s preferred or intended interpretation.*”

This tells us that whether or not a system or narrative is created with the purpose of creating a highly didascallic or intelligible narrative, a user can still experience closure on either of these levels.

The two models of Emergent Narrative

In his 2011 paper, Emergent Narrative in Interactive Media. Richard Walsh, sums up a lot of the discussions that have been going on. He says that the essence of the concept of emergence is readily conveyed although it will become slippery as you examine it more closely. (Walsh, 2011) He explains emergence as being:

“[...] a feature of complex systems: the term refers to phenomena or behavior produced by a system but not apparent from an inspection of the elements of the system and the laws governing it. “ (Walsh, 2011)

Walsh talks about how this seemingly straightforward notion gets more complicated in the context of digital media, which is where the context of emergent narrative is being developed. He sees two distinctions in

Background

how emergent narrative is being treated. First, is what could be classified as the storification process explained in this paper, and second, is how Ruth Aylett and others have, started to see emergent narrative as a product of interaction between the user and the digital agent, or bot within the simulated environment. (Walsh, 2011)

The two ways or models of looking at emergent narrative are similar, but have different implications. Both look at interactivity as a prerequisite for emergence, but where in the interaction between the user and the system, the actual creation of the narrative takes place, is where they differ (Walsh, 2011). The storification process looks at emergent narrative as being created within the player himself, using his cognitive processes, but affected by the feedback his interactions with the system offer. The second model, a character based narrative system, is meant to create emergence of narrative through interaction, but within and from the system. The user will then observe and experience the narrative as it is presented by the system.

As the authors of this paper, we will not say one direction is better than the other, since both strive towards the design and creation of emergent narrative. But this does seem to explain, what we perceive as some of the confusion emanating from within the field. Maybe the secret isn't to simulate narrative but to orchestrate the experiencing of it, and while the character narrative systems are not fully developed, we should still be pursuing emergent narrative on a personal level through the creation of systems which can facilitate its emergence within the player himself. Ken Levine's, creative director and co-found of Irrational Games, quote from the game developer conference in 2014, seems to sum up that same opinion.

"[...] the robust solution to characters and A.I is still far away, so a real solution to this [how to create emergent narrative] lies beyond any technology or creative horizon that we currently have. We are really just scratching the surface. I think we are giving up the good for the great because i think there are really major steps we can make here and now [using our current technology]. But we have to focus our attentions a little bit. If you are overly ambitious, it can lead to paralysis [...] "Physics in games wasn't built in a day. At the start it was shown simply with circles rectangles and spheres, but still dealing with a subset which were then added and build on to. When these first things appeared [Physic simulations] we didn't dismiss them but rather thought they were exciting." (Levine, 2014)

He suggest the same with systematic modeling of characters. Instead of modeling everything, limited sets of believable and impactful things should be the starting focus in this process.

But what else has been going on outside of the research community? Are there examples of developed and released games that offer emergent narrative experiences, and what is the industry's perspective on emergent narrative?

2.6 Emergent Narrative and the Video Game Industry

A great deal of the narrative discussion in the industry concerned itself with how to tell better stories in games. Often times, the design focus is on using and implementing Hollywood like narrative structures (a more distinct version of the Freytag triangle) within game environments, thus using intermedia methods to present stories in games. This still causes the problem of keeping story and gameplay distinct and separate from each other, and increasing the likelihood of narrative paradoxical situations arising. Other types of games have implemented narrative through systems described by Ryan earlier in this paper, see figures 3-5. The narrative methods that are commonly used will often be cut scenes, or in game or computer generated imagery to show players snippets of story in between interactive gameplay sessions. Although these methods have proven to be lucrative, and good linear stories often emerge from it, the industry has started looking more into the possibilities of the medium as an interactive one.

As stated earlier, the industry started picking up on the possibilities of emergent narrative, around the same time as Aylett released her first paper on it. Marc LeBlanc, in his talk 'Formal design tools' at the Game developers Conference (GDC) in San Francisco in 2000, talked about how story can emerge from the player's interactions with a system, and not only from embedded narrative. He said that by giving the player enough interaction possibilities with the system, the player would start feeling less like he was participating or following a linear story, and more like he is creating his own. (Salen and Zimmerman, 2003)

Other game designers and game industry professionals have since picked up on this concept and a great deal of discussion is ongoing about what these story systems could, and should, include. Steve Gaynor, in his blog from 2009, 'Storymaking', talks about different levels of story creation in games. He wants game designers to stop trying to tell stories, but rather start designing story spaces that allow the player to create their own. (Gaynor, 2009)

One should not ask a game designer to tell them a great story; rather, the game designed should be judged on the player's ability to make his own stories within its mechanical framework. (Gaynor, 2009)

Background

Gaynor goes into, what we see as using human storification as a measure of what can be classified as a story, and then discusses these stories on different levels of story making, on a micro, mid and high level basis.

The **micro-level** is explained as the moment-to-moment events and actions taken by the player, or what we have already talked about as emergent gameplay. The games that give the player the freedom to approach situations with different methods and solutions and chain reactions of events can spun from the interplay between seemingly unrelated mechanics. The examples he mentions are the gunfights in Far Cry 2, where different outcomes depend on the player approach or timing of actions, the seemingly random chaos that can emerge while playing a Grand Theft Auto game, or the plethora of ways to approach dispatching a zombie horde in Dead Rising. (Gaynor, 2009)

He explains the **mid-level** story making as the player exercising his agency over how and which fictional parts or elements of the gameplay he experiences, and in what order. In open world or sandbox games, the player is sometimes allowed to choose quests or missions in the order that he wants do to them. An example would be the wasteland of Fallout 3, Red Dead Redemption or The Elder Scrolls V: Skyrim. Or when a player makes choices within a branching narrative. (Gaynor, 2009)

High-level story making is when the player is allowed to determine which elements are present in the game world. The narrative then becomes a collaboration between the player and the system. The designer then only supplies embedded narrative elements and interactive systems, and it is then up to the player to use these systems to reach his own or game created goals and through that the story emerges through that interplay. Examples of those systems would be a Civilization game, SimCity and any of the games from the Sims franchise. (Gaynor, 2009)

These three forms of story making, can still serve as a good basis for discussion about story worlds and how they can present narrative and game mechanics.

In 2008, Levine held a talk at the Game developer's conference called *Storytelling in BIOSHOCK: Empowering Players to Care about Your Stupid Story*. Levine, who is well known for his work on Thief: The Dark Project and the Bioshock franchise, advocated for new thinking for game developers and suggested a pull, not push method of narrative through a system where the narrative is pulled out of the players interactions within the system and not pushed on to them through the more linear form of story writing. He talked about how games should encourage players to discover and experience narrative instead of pushing it on to them through cut scenes and other linear methods. He says that games are a much stronger medium for other kinds of storytelling, where optional and discoverable story should be the aim.

Background

People, by making decisions and acting on them, and then being rewarded by discovering something special that they would otherwise have missed, is the direction narrative development should be taking.(Levine, 2008)

Six years later, Levine was back to GDC with his lecture 'Narrative Legos'. There he talked about how the systemic and ludic nature of games is conflicting with the narrative systems, and discussed how it could be possible to create systemic, player driven, re-playable narratives. (Levine, 2014) Other than being a new design method, what Levine is talking about can be classified as a system designed to create emergent narrative. Levine is currently working on a game where he is trying to implement this kind of a system, but no release date or further information has been released as of the writing of this paper.

In the narrative design of computer games, the most widely used method would be a linearly structured narrative. Linear narratives can be extremely expensive to make, and sometimes the pieces of linear narratives will not be able to "speak" or affect each other. The choices the player makes are therefore mostly meaningless in the grand scheme of things (Levine, 2014). The method that game designers try to use to create more meaningful stories is to implement branching narrative structures. But the problem with branching narrative, is that although it gives the player some choices that might feel meaningful, the player is often excluding himself from game content that the designers created. This also means that more money is spent on story writing and different implementations on top of limiting the player's access to all the game has to offer.

"I spend five years [working on a game] and 12 hours later the player is done with it, and that is heartbreaking. There are some fans who will replay it but you can't expect that from the average gamer because it won't be meaningfully different the second time, and that is an important challenge." *(From an interview with Ken Levine about Bioshock) (Crecente, 2013)*

Another point Levine makes is that when creating a linear narrative structure, it becomes impossible to add *into* the experience afterwards, you can only add *on* to it. What he means is that after creating and releasing a linear narrative product, the only way to create and sell DLC, or publisher created, downloadable content, is by adding to the back or front of the story already created. This would mean more time spent on writing and developing additional content to the game. He thinks that by creating systemic narrative, a developer could continue adding into the system, by making it more complex or by adding individual new elements using a fraction of the time or money required for the former. (Levine, 2014)

Background

Looking at emergent narrative based on Levine's and others discussions about the topic, poses a question about the actual value a player is receiving from a strong linear narrative game. It is hard to measure such things on an emotional level, although game reviewers and ratings do a good job at classifying which of these games are perceived as "good" to the general public. But another way of looking at the value of a game would be the replay ability, and the amount of time players spend within a game world. An independent study done by Ars Technica shows the top played games on steam, and the mean number of hours spent playing, per owner.



Figure 7. Independent data analysis on official steam data showing the mean of average hours players have played it.

Figure 7 shows an independent data analysis on official steam data. The mean represents the average hours spent in game, per player. (Orland, 2011) Games on the top of the list, are either multiplayer online games, or systematic games that we think both offer a strong emergence of narrative and replay ability and/or mod ability. None of the most played games could be classified as linear, except perhaps Skyrim which on the other hand offers an immensely large open world environment to explore.

2.7 Emergent Narrative in Commercially Released Games.

With parts of the industry broadening their focus on how to create more engaging, dynamic narrative experiences for players, the implication could be that nothing out there is already offering that experience. But that is not the case, the following section will look at a few of the released commercial products, that have either consciously or by accident, succeeded in the facilitation of emergent narratives.

Crusader kings 2

Crusader kings 2 is a grand strategy game which occurs in the middle ages, developed by Paradox studios, and released in 2012. The game has, as of September 18, 2014 sold over 1 million copies, and 7 million copies of DLC and expansions. According to Polygon, an online game news site, the average player has clocked around 100 hours. (Hall, 2014) As a comparison, the average player on Bioshock Infinite, has spent approximately 15 hours on it. (Bioshock Infinite, 2015) (SteamDatabase, 2015)



Figure 8. Crusader Kings 2 gameplay

In a lectures at the 2014 game development conference, Henrik Fåhraeus, game developer at Paradox Studios, talked about the emergent narrative system designed for Crusader Kings 2. According to him, the team at Paradox, sees the creation of an emergent narrative system as the key to infinite replay ability. The design focus is on the creation of scripted narrative snippets, which appear to the player, out of the simulation itself, and their goal is for these emergent stories to become as immersive as linear structured narrative. The focus of the lecture was on how the interplay between scripted narrative events, player input and AI actors, with personalities and opinions, merged to create strong personal narrative that feels unique to the player and his specific play through. In the game, the player's character is always the current ruler or king of the country he has chosen. As an example of one of the stories that can emerge from the system, Fåhraeus gave the following bits of story points which can appear in the game. (Fahraeus, 2014)

Background

- King Mielus (Player Character) of Finland had four sons
- The king gave them all titles (player action)
- Mielus dies (random chance) – the player is now Lalli, the oldest
- The second, Prince Urho, starts a civil war (AI agenda)
- Lalli loses and dies (chance) in the dungeons of his brother
- Lalli's son Miemo succeeds to the remaining titles
- Miemo, (Now, the player), starts a war for the throne (player action)
- Miemo loses and is beheaded (AI hatred) by uncle Urho
- The player now becomes Urho, his own killer!
- King Urho, "the Possessed", has five sons of his own
- The impatient oldest son, or possibly his Ambitious (trait) wife (AI ambition) has father Urho murdered
- Another round of civil wars ensue
- More sons and grandsons of Mielus perish one by one

Table 2. Example of EN, as given by the developers of Crusader Kings 2

This narrative, is presented in short bullet points (see Table 2), but players tend to take it further in their retellings of the narrative and there exist strong communities online where players regularly detail some of their stories. See Appendix A, for some of these stories.

Some of the statement made by Ken Levine, in his Narrative Legos lecture, can be supported by looking at the work and results of Crusader kings 2. First of all this focus on interplay between character AI, and player input seem to indicate that they really achieve the goal of creating a strong emergent narrative. Second of all, to support Levine's claim about "adding in" being a more preferable option to "adding on", there have already been released 52 individual DLC's or Downloadable content packs for Crusader Kings. These add on packs bring different types of new features to the narrative system. Increasing the replay ability, and adding relatively cheap (for the producer) content to the game.

DayZ

DayZ is one of the more interesting success stories of the gaming industry of the past few years. Originally, DayZ was first released as a free, user created modifications for the Arma 2 engine, a popular military simulator. The creator of DayZ, Dean Hall, wanted to create a game about his experience in the army, where players would be forced to think about surviving in post-apocalyptic world. The way Dayz is different



Figure 9. DayZ gameplay

from other post-apocalyptic games, is that this is one of the first games to truly implement human survival mechanics, and on top of that, without adding any real narrative elements. The player needs to think about gathering food and water, scavenge for limited supplies and heal broken bones and bandage bleeding wounds. All this happens in a huge game world, populated by zombies and other players. No other objectives are given by the game, and the player spends most of his time alone, wandering around looking for supplies, with moment of intense terror or suspense in between, when meeting other players and not knowing if they are friendly or not. These bouts of terror, are supplied by one of the key ingredient to the game, perm death. If the player's character dies, he is gone for good and all the work put into it and supplies gathered are gone with it. There are no real rules, missions or objectives in Dayz. The player only has one goal that is to survive. The stories of Dayz are then crafted as you encounter different players in the game world, and the often tense interactions between them. By killing another player, you can then loot his body and take all the supplies that he has spent his time scavenging.

Adam Ruch wrote up the story of one of his in game encounters in an article on game.on.net. a copy of the article can be seen in Appendix A.

Far Cry 4

In a video interview on Gamespot, an online games news site. Creative director of Far Cry 4, Alex Hutchinson explains how their design tries to put emphasis on player driven stories and emergent narratives. Far Cry 4 is new newest installment of a franchise which started in 2004. The premise for all the Far cry games are similar. It is an open world, first person shooter where the player takes part in liberating a story world from



Figure 10. Far Cry 4 gameplay

its oppressors. In Far cry 4, the designers wanted to marry the narrative with the gameplay where they try to glue the narrative with the open world. Hutchinson, talked about the cognitive distance between linear narrative structures and how player in game decisions can conflict. Something the theoretical community has talked about in great lengths, and can be called the narrative paradox. In order to try to fix this problem, the designers of far cry 4 try to create a narrative focus within the game environment, where when the player conquers areas, the characters inhabiting the world will respond by retaliating or trying to take back these area or by defending them based on their inclinations.(Hutchinson, 2014)

Another point he makes is that of a silent protagonist. The narrative in Far cry is seen in the first person, so it fits within Callejas Personal narrative perspective. An important aspect of that in Hutchinson's mind, is that the main protagonist should be a silent one. He says a distance gets created between the player and the protagonist when the in game character starts voicing his opinions, to which the player might not always agree. The game will also not judge the player on his decisions, but allow him to make them, and face the consequences, be they good or bad. (Hutchinson, 2014)

Far Cry 4 could be thought of as a narrative anecdotal factory, since a lot of the emergent narrative arises from emergent gameplay. This is also one of the selling points, where the coin the term “every second is a story”. But as has already been discussed in this paper, these anecdotal, emerging gameplay events, will not always create coherent stories out of them. For that to happen the system needs to create cascading effects, or repercussions to the player's actions. (Hutchinson, 2014)

In Hutchinson's mind, this is all work in progress, where the end goal would be a game where you felt an epic narrative, as in a scripted game, but all the narrative would be based on decisions and choices that the player chose to pursue. (Hutchinson, 2014)

2.8 Research Focus

As can be seen throughout our earlier discussions, Emergent narrative is a concept which has captured a great deal of the research and development community's interest. Considering that the ongoing feud between narratologists and ludologists has finally been put to rest, the focus could now turn to the facilitation of narrative experiences, through the creation of systems and games which through their, systematic or character based design, could create special and one of a kind narrative in the minds of their players. Video games are a medium which has a real special feature which on other mediums have: The power to allow the player to influence and change the virtual environment. But narrative theory needs to change and adapt to this new form of storytelling, and the research needs to be refocused to include what the video game industry is already doing to expand and change this medium.

We see the need to try and bridge the gap between the industry and the theoretical environment. If the industry is already creating systems that sparks the emergence of narrative, those games need to be found and analyzed to see if those systems differ from the current theory, and if they do, how. In order to do so, emergent narrative needs to be quantified in some way. There are a number of game researchers that have analyzed and gone in detail into what constitutes a good player experience. Things like immersion, engagement, flow, player type, video game addiction, and more, all of which have been researched and analyzed by a number of people, and the work continues still today. But emergent narrative in video games has never, to our knowledge, been quantifiably tested. The reason might be the ongoing disparity in the research where not everybody agrees on what emergent narrative truly is, or the focus has shifted to the creation of emergent narrative systems. What we want to examine, in rest of this paper, can be summed up in these questions:

Research Questions

- How can we test the intrinsic creation of emergent narrative?
- Is there a measurable relationship between emergent narrative, and immersion and narrative transport like suggested in the theory?
- Given that we succeed in the first point, are there specific ludic elements present in highly emergent games that enhance or support a more emergent narrative experience?

We see this as a valuable addition, both to the research community, and game industry. Looking at how emergent narrative is created, and which kind of games create it, would be valuable to the research community by showing what to look for and where. For the video game industry, this data collection could also serve as a valuable pool of information to see what design tools are working in this field and which is not.

3 Emergent Narrative Definition

Based on what has already been stated in the earlier chapters, and the fact that emergent narrative has such wide range of different classifications, we see a need to define it for ourselves for the purpose of this research project. In essence, we define emergent narrative as the following:

Emergent narrative is created, internally by the player, as a non-scripted self-narrated player story that gives closure.

Or in other words:

“Emergent narrative is an intrinsic experience, which transpires as a mental process, through cognitive storification or alter biographing, as a player interacts with a systematic virtual environment. As the player navigates and interacts with the game environment and ludic system, the story emerges through that interaction, either during the play session, or after-the- fact, once the player has had time to reflect on the experience events. The story that emerges is therefore a non-scripted, self-narrated player story that gives closure, which can appear through a collaborative process between the system and the player. This feeling of closure can either appear from within the system itself, or in the mind of the player, depending on the abstract or didascallic nature of the narrative. It is a narrative, that to the player feels unique, or one of a kind. The narrative in itself does not have to be one of the kind, but the system needs to be complex enough for the player to experience it as such. “

Emergent narrative could be explained to a player as:

An emergent narrative experience is something that happens to you as the player, as you progress and interact with the game world.

Emergent Narrative Definition

Under some circumstances the player might start experiencing events or “stories” that don’t tie directly into the storyline of the game, but rather are events that you feel are unique stories happening to you just because you chose to act in a certain way (and might not happen again).

In order to set up the research to answer the research questions posed above, a number of things need to be addressed in the following chapters.

1. First of all, the released video games that give indications that they are creating emergent narrative experiences need to be found.
2. A questionnaire needs to be created that will accurately rate games based on their emergent narrative experience they offer.
3. The player experience needs to be analyzed in great detail using proven methods to locate patterns or design methods that are more likely to facilitate the emergence of narrative.
4. On top of that, the design considerations, or game mechanics of those games need to be looked at to see further if any patterns or design considerations seem to work better than others.
5. And lastly, the player types of the test participants need to be looked at to see if certain kinds of people are more prone to experience emergent narrative, than others.

4 Analysis

To answer the research questions listed in the previous section, this chapter will go through them one after the other and explain the process used to create the final research survey.

4.1 Defining Families of Games

In order to measure emergent narrative, released video games that give indications that they are creating emergent narrative experiences need to be found. An important aspect that we find must be present in a computer game, is that it must be ergodic. It must be a non-trivial exercise to play the game, otherwise it would more a film or movie than a game.

Like Calleja, we have defined a broad family of games that we have classified as all games that has a *virtual game environment*, which we use as an overall requirement. This a family that includes games that are set in a simulated world, with its own “Laws of nature”. This excludes digital board or card games and other abstract games. And it includes games where it is possible to navigate a world and participate in different activities, like Minecraft, Skyrim and Crusader Kings 2. (Calleja, 2011)

Secondly, In order to define families of games based on their narrative potential, we looked to Ryan's Narrative Modes and combined it with Calleja's perspectives on segmenting fictionality.

[...] the richest story worlds allow meaningful narrative action to emerge in the real time of user computer interaction. In this type of system, the designer populates a world with agents capable of diverse behaviors and the user creates stories by activating these behaviors, which affect other agents, alter the total state of the system and through a feedback loop, open new possibilities of action and reaction. When the world contains a high number of different objects, and when these objects offer a reasonable variety of behaviors, the combinatorial possibilities are so complex that the designer cannot anticipate all the stories that the system can produce. This emergent quality is raised to a higher power when the user interacts not only with system generated agents of limited intelligence but with human partners capable of far more imaginative and diverse behaviors, as is the case in multiplayer online virtual worlds.[...](Ryan,2006)

Types of Interactivity

In order to shift the focus of interactivity onto the virtual worlds, Ryan draws on Espen Aarseth's typology of user perspective in cyber texts. She proposes a way to distinguish between four types of interactivity based on the pairs of internal/external and the exploratory/ontological. (Ryan, 2006) For the purposes of this paper, we intend to use these types in order to classify what games are the most likely to offer the emergent narrative experience.

Internal: The internal type of interactivity is when the player will project him or herself as a member of the virtual environment. This happens when the player starts identifying with an avatar, which can be shown both in the first and third person perspective. This is a good method of classifying how you can internalize video game characters, but there needs to be put a question mark on the difference between seeing a game character in a first or third person perspective. The self-narration, or self-projection, gets harder and more fantastical when a character is seen in third person, because in first person, the perspective is the closest to the one of yours in real life. Still we will keep this classification without making that distinction. (Ryan, 2006)

External: In externally interactive games or interactive applications, the user's viewpoint will be situated outside or above the virtual world. The player doesn't "physically" partake in the happening of the world, but rather participates in the role of a god or an all seeing entity which can affect the action taking place below. (Ryan, 2006)

Exploratory: In exploratory interactivity, users navigate the display but this activity does not make fictional history nor does it alter the plot. They therefore become almost passive observers of the narrative, and their choices do not have any changeable effect on the story world. (Ryan, 2006)

Ontological: By contrast, in ontological interactivity, the decisions of the user will affect the story and story world in predictable or unpredictable manner giving a sense of agency or participation in the story. Ryan sees Ontological design consideration as the one most likely to facilitate emergent narrative (Ryan, 2006)

Ryan goes further in defining the different types of interactivity, in figure 11 it can be seen how different types or genres of video games and interactive media can fall into the different categories shown.

Analysis

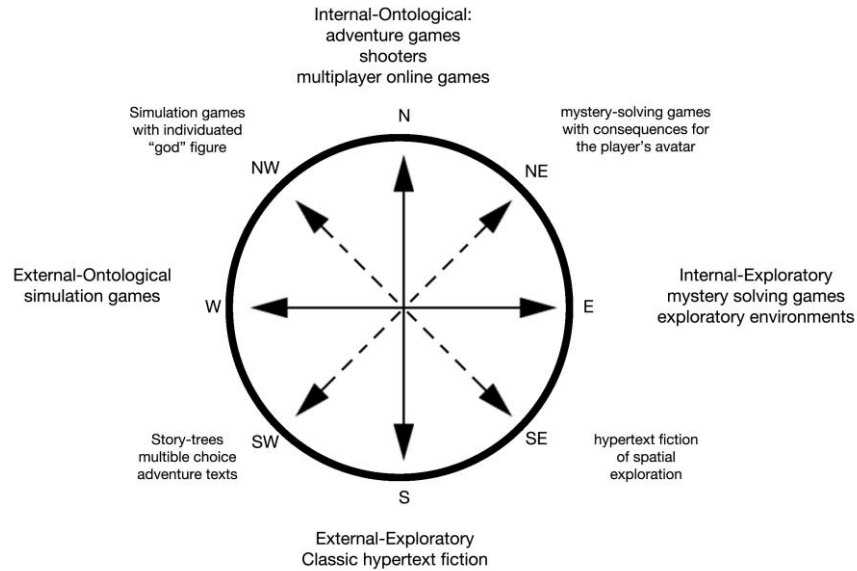


Figure 11. Ryan's types of interactivity

Segmenting of Fictionality

To add to this classification of games, which Calleja also sees as an important topic, he suggests looking at the segmenting of fictionality, which he says can be expressed through three focal perspectives. These perspectives, which can be seen in figure 12, will be used in conjunction with Ryan's Narrative modes, to further classify games based on both their narrative modes and fictional perspectives. (Calleja, 2009)

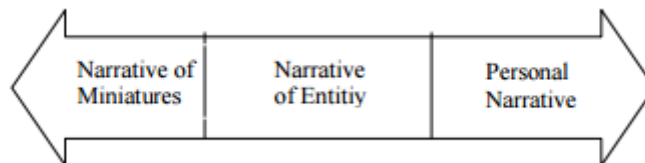


Figure 12. Calleja's perspectives on fictionality

Narrative of miniatures: Calleja defines the narrative of miniatures as a focal perspective where the player does not embody or control only a single avatar in the game world, nor is the player fixed to a specific point in the game world. The player therefore has an omnipotent view point and can sometimes control a number of different entities. This is most regularly seen in real time strategy games, or simulations games like SimCity, or the Sims. Games can work with these perspective on multiple levels, an example Calleja mentions is the perspective given to the player in the Total War games; where it is possible to switch between a turn based world maps where the player will control the overall details of his empire. Activities like diplomacy, production or army movement are done in this perspective. The second option is a real time

battle overview, which Calleja argues gives the player the ability to participate on the entity level of narrative, where he partakes from the viewpoint of the general (Calleja, 2009). We do not completely agree with that, since the main change between the world and battle map viewpoint in the Total War games keeps the miniature level of perspective, even though the focus goes from country or empire management into army management, the player still hold a god like view of the battlefield, and the general is one of the units he can give orders to.

Narrative of Entity: The narrative of entity is when the perspective is that of an in-game avatar, which is controlled by the player and seen in third person. The player is then more likely to identify with the in-game avatar instead of projecting themselves into the game world, like can happen in games that use the first person perspective. In the narrative of entity, the player is more likely to experience the narrative from the viewpoint of the in-game character than as something that is happening to them. (Calleja, 2009)

Personal Narrative: In personal narratives, the player experiences the story as happening to themselves instead of a character delivered by the games designers. This is most often seen in games using the first person perspective. But a requirement for that, is to keep the protagonist relatively silent, since some games tend to create entity narratives in first person perspectives by giving the player entity too much to say, or ways to voice their opinions which might differ from those of the player. Still despite the perspective given by the game, a narrative normally becomes a personal narrative or a narrative of entity based on the disposition of the player, and whether or not the identify themselves AS the character, or as only controlling a character. (Calleja, 2009)

4.2 Choosing Games for the Study

The next step, is finding released game products that already seem to facilitate the experience of emergent narrative. A few of the games already mentioned in the background chapter fall into that category, based on the fact that the designers were indeed trying to create emergent narrative with their games. But in order to get a broader spectrum to analyze, this next section will talk about how a total of twenty games were chosen for the research.

Following the discussion in the background, on using descriptive narratives as indications of a strong narrative experience, we went online in search of communities of gamers who have written detailed stories,

covering their experiences in games. On Reddit¹ and other online gaming forums, we found a striking amount of player reported stories on certain games, these stories vary in length and detail, some even as long as short-novels or novellas (Appendix A). From this we make the assumption that the players of those games were indeed experiencing some form of *emergent narrative*.

Apart from our own online search, we used Ryan's modes of interactivity and Calleja's perspective theory to try to cover a broader range of game types. According to Ryan, Games that are internally ontological, or externally ontological are more likely to create emergent narrative than other types of games. We therefore focused on choosing games that would fall into those categories.

For analysis purposes, we wanted to include a wider range of games. Both games that seemed to offer *emergent narrative*, but also games which could serve as comparisons; from other genres or design considerations and games that fall into the modes of interactivity.

Additionally we wanted to include a few more basic, so called, "arcade" games (games that were originally played on arcade machines or the first generations of home entertainment consoles). Our reasoning for this, is that if our understanding and expectation towards emergent narrative was correct, these types of games would have relatively rare instances of *emergent narrative*, and could therefore provide a baseline for the questionnaire.

As part of including as a wide a range as possible, we wanted to include games that offered either multiplayer or single player experiences, to see if and how, a social aspect would influence the appearance of *emergent narrative*. In Calleja's 2013 paper, Narrative Involvement in Digital Media, he talks about how multiplayer games can be compared to improvisational theaters. (Calleja, 2013)

"[when talking about player actions in some multiplayer games]...Their actions are enthrallingly unpredictable and most importantly we become characters in their experiential narrative. Multiplayer games, therefore, create a situation akin to

¹ Reddit is a form of online Bulletin board, a kind of forum, where users can post content of varying types, to share with other users. A subreddit, is a sub section of this forum, concerned with a particular subject. Convention has it that subreddits are named by using a shorthand (Bold in the following example) of their full URL: <http://www.reddit.com/r/minecraft>

Analysis

improvised theatre where all participants are at once audience and actors, influencing and being influenced by each other's presence and actions.[...]”(Calleja, 2013)

Further inclusion considerations were the size of the online communities. Since the aim was to create an online survey, we wanted to reach some of the bigger communities of games and their gamers that fitted into our classification. On Reddit.com, individual SubReddits show the number of people that subscribe to it, so after classifying a list of possible games that all met our requirements, we would in some instances pick the games with the bigger community.

On top of this, considering Ken Levine's discussion on replay ability, we wanted to include some of the games that appear on figure7. If replayability or time spent in game, is any indication of emergence, we wanted that to be included as well.

	Internal	External
Exploratory	● Battlefield 4 ● Bioshock Infinite	● Super Mario ● Spellunky ● Space Invaders ● Donkey Kong
Ontological	● EVE online ● Skyrim ● Arma 3 (Multiplayer) ● Far Cry 4 ● Minecraft ● DayZ	● Mount & Blade: Warband ● RimWorld ● Europa Universalis 4 ● Total War: Rome II ● The Sims 4 ● Civilization 5 ● Crusader Kings 2 ● This War of Mine

Figure 13. The chosen games divided into Ryan's types of interactivity.

Analysis

Narrative of miniatures	Narrative of Entitiy	Personal Narrative
● RimWorld ● Civilization 5 ● The Sims 4 ● Europa Universalis 4 ● Total War: Rome II	● Bioshock Infinite ● Super Mario ● Spellunky ● Space Invaders ● Donkey Kong ● This War of Mine	● Battlefield 4 ● Far Cry 4 ● Minecraft
	● Crusader Kings 2	● Mount & Blade: Warband ● Skyrim ● Arma 3 (Multiplayer) ● EVE online ● DayZ

Figure 14. The chosen games divided into Calleja's Perspectives of fictionality

On figure 13, the games that were chosen for the final survey can be seen classified on the internal/external and exploratory/ontological scale, and on figure 14, the classification on the range of narrative of miniatures, entity and personal narrative. The amount for the first figure is highly skewed towards the external and internal Ontological in order to compare games that are expected to be emergent, and in the second figure, a relatively even range was kept. With some games falling into two categories based on their design. Skyrim for example offers first and third person view, as do some of the others. While Crusader Kings 2 could be classified both as a narrative of miniatures and narrative of entity.

Obviously there exists an extraordinary amount of games so there is no way feasible to investigate all of them. But the games we chose have all been released in the past five years (with the exception of the arcade games, and EVE Online, which has received continuous updates since its launch in 2003), and all have a relatively big and active online community. The games chosen are listed below and each game has a short description of it.

Online Storification Processes

First we will mention the games where we found a strong presence of online descriptive narrative, or where players discuss and retell their experiences on forums and subreddits in a way that could strongly indicate an emergent narrative experience.

Civilization V

Civilization V is a grand strategy, simulation game. The player is cast as the immortal leader of a historic civilization and must guide it, from its birth in the Stone Age through to its triumph in the semi-futuristic end era of the game. The player see the world from a top down perspective and must either eliminate the other civilizations, overwhelm them with culture impact or research enough science to launch an interstellar space (colony-) ship.



Figure 15. Civilization V gameplay

Crusader Kings 2

Crusader Kings 2 is also a grand strategy simulation game, set in the medieval ages, where the player takes on the role of a ruler of a kingdom somewhere in Europe (and a little beyond). The player character has a number of traits and personality options, that will influence how other characters react to them in-game. When the player's current character dies the player will take on the role of the heir, continuing the dynasty. It features a top down view on the world, showing the armies of all the nations. The actual player character is not represented as a model in game. The player has many options for diplomacy with the other nations and characters. This game has no explicit goals that are set for the player.



Figure 16. Crusader Kings 2 gameplay

DayZ

DayZ is an open world survival and exploration game. You are in a world overrun by zombies and must scavenge for all resources needed for survival. If you die, you lose all the resources gathered and must start over. It is a first/third person game.



Figure 17. DayZ gameplay

Europa Universalis 4

Europa Universalis 4 is similar to Crusader Kings 2, in that it is a strategy simulation game, developed by the same developers. However it is a little more abstract than Crusader Kings 2. In it the player takes on the role of a country, rather than a dynasty. So the “character” of the player is the country itself and so does not have traits in the same way. However they have given each country traits that represent the spirit of the country.



Figure 18. Europa Universalis gameplay

Like Crusader Kings 2, this game does not have any goals that are set for the player, it is also a top down view on the world.

EVE Online

This is an online multiplayer game, where all players play in the same universe. It has a science fiction setting, where players fly space ships across a galaxy that is not the Milky Way. The player is not given any goals in game and must forge her own path, participating in many different professions. They can fight non-player entities as well as other players. The majority of players join what is called a Corporation, a collective of players who band together to achieve more than what they could on their own. The avatar of the player was for a long time, not represented in game (other than the player’s spaceship), but an update from 2011 enabled the players to step out of the ships and into a personal crew quarters on station. The game is exclusively third person.



Figure 19. EVE online promotional picture

Rimworld

This game is a top down survival simulation game. The player is in charge of a number of characters that crashland to an alien planet. Here they have to build a shelter and provide for themselves, until they can gather enough resources and knowledge to build a small spacecraft to escape the planet. The game has a blocky world that is viewed top down and characters are cartoony representation of people.



Figure 20. RimWorld gameplay

Total War: Rome 2

Rome 2, as it is also known, is a strategic and tactical warfare simulation game. The player takes on the role of a civilization, in the classical antiquity period and must build up the military power of the civilization to overcome the other factions in the game. The game features two views; one being the strategic overview of the world, with armies and cities represented by models on the world and the tactical view, which is employed when two armies meet in battle. In this last view, each person in each army is represented and plays a part in winning or losing the battle.



Figure 21. Total War: Rome 2 promotional picture

Emergent Narrative Potential

The games here, are selected based on their emergent narrative potential. They include game mechanics that we expect to be strong in emergent narrative, or system designs, or design considerations, which we perceive as possibly allowing for emergent experiences.

Far Cry 4

A single player first person shooter. It features a strong narrative and an open world to explore. It was designed to allow the players to experience the story on their own terms and in their own time. It has many features commonly found in role playing games, but it retains the feel of a first person shooter. The main objective of the game is to explore the story of the game world.



Figure 22. Far Cry 4 promotional picture

Minecraft

An open world, exploration, survival game set in a block-based world. Minecraft has no real goal or objective. But the game offers an extensive building system which allows the player to gather resources and build almost anything they can imagine. The game can be experienced from a first and third person viewpoint.



Figure 23. Minecraft promotional picture

Mount & Blade: Warband

Mount & Blade: Warband is an action role playing game, that sets the player in a medieval world and it is up to the character to build up reputation and gather followers, to eventually become king of a part of the land. There are no clear goal for the player, but NPCs do give quests to start the player off on a path. The game can be experience in first and third person in parts of the game, but also in and omnipotent view while traversing the game world. This is one of the games Calleja mentions as being an example of a game environment which invites players to construct their own narratives without relying on scripted narrative progression. (Calleja, 2013)



Figure 24. Mount & Blade: Warband gameplay

The Elder Scrolls V: Skyrim

The continuation of a long standing series of role playing games, set in a fantasy world with swords, magic and dragons. It is a first/third person game, with (at the time) state of the art graphics. You take on the role of the Dragonborn, a legendary figure, destined to either save or doom the world. The world is open for exploration and the player can go seek side quests at any given time, while leaving the main story line for when it is desired.



Figure 25. The Elder Scrolls V: Skyrim gameplay

The Sims 4

Perhaps the most known life simulation game and one of the most referenced game when it comes to talking about emergent narrative. The Sims 4 is a top down simulation of AI characters that all have needs and desires, along with likes and dislikes. The player creates the environment in which the characters act and can, to some extent, control the character one at a time. The goal of the game is to live the life of your Sims; there is no predefined goal for the characters in the game.



Figure 26. The Sims 4 gameplay

This War of Mine

A survival game of sorts, *This War of Mine* is a little different than most other wartime games. The player is in charge of a number of civilians, trying to survive in the hell that is a city under siege and assault. The player directs the characters in building a “secure” (read: not outright dangerous for themselves) base, from which they can scavenge for supplies at night time. The player is presented with moral dilemmas; do



Figure 27. This War of Mine gameplay

you steal from the hospital or other survivors, to save your friend who is at death's door? Do you kill a soldier who is abusing and possibly raping a woman? The player must take these decisions, all the while trying to gather enough food and water for the characters under her care. The viewpoint of the game is a mix of third person and side-scrolling “top down” view and the goal of the game is to survive.

Comparative Games.

The following games are chosen based on their comparative potential. They have something in common with games where the EN is expected to occur, but something in their design leads us to believe they might score lower on the scale.

ARMA 3

ARMA 3 is a popular military tactical shooter game. It is heavily focused on realism and the player takes on the role of a trooper in a small military force and must direct the other troops or receive orders from above and execute them as planned. It has a first and third person viewpoint. The game world is one of the most expansive, that video games offer with a fully-fledged three part single player campaign. Still, one of the main attraction for many players, is its online multiplayer



Figure 28. Arma 3 promotional picture

aspect. In this, a group of players take on, mostly, player-designed missions and event. In many of these encounters, a full force structure is set up, with rear-commanders giving out orders based on intelligence gathered by recon teams and so on. The reason for choosing this game is that it is built on the same engine as DayZ, and uses in many aspects the same game mechanics. It will therefore serve as an interesting addition in comparing the two.

Bioshock Infinite

A single player game with a strong linear narrative, Bioshock Infinite puts the player into the role of the main protagonist in the story written by the developers. It is a first person shooter game, featuring a very rich and complex environment. It is set in a slight fantastic world, with psychic abilities and strange technology. Your objective is presented to you in the story.



Figure 29. Bioshock Infinite promotional picture

Battlefield 4

Battlefield 4 is an online first person shooter game set in modern day environment. It contains all the elements that are iconic of the genre. The objective of the game is to shoot and kill all enemies you encounter. The game does contain a single player campaign but it is the multiplayer aspect that draws players back to it.



Figure 30. Battlefield 4 gameplay

Expected Baseline

The following games are chosen because of our belief that they can serve as a baseline for the survey, and not showing strong emergence of narrative.

Donkey Kong

Donkey Kong, released in 1981 is an arcade platform game, where your goal is to rescue the princess at the top of the screen, from a big gorilla. You must jump obstacles and enemies and climb ladders to get to the top of the screen.

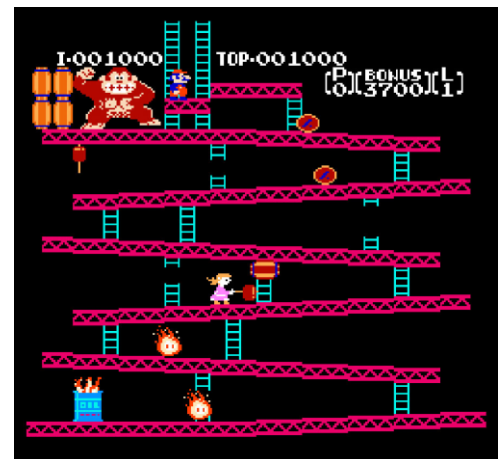


Figure 31. Donkey Kong gameplay

Space Invaders

We all know Space Invaders, right? In case you do not; it is one of the earliest shooting games, created for arcade machines. The player takes on the role of a tank of sorts, on a two dimensional fixed-space environment. The enemies descend in ordered ranks and your job is to shoot them before they reach the bottom.



Figure 32. Space Invaders gameplay

Spelunky

Spelunky is an award winning rogue like platformer, developed by Derek Yu, and released in 2008. In Spelunky, the player controls a “spelunker” who navigates through randomly generated levels in search for treasures and secrets. There is no specific storyline, and has been put in league with the early platform games like super mario.



Figure 33. Spelunky gameplay

Super Mario Bros

In Super Mario Bros, one of the more iconic video games ever released, the player takes on the role of a plumber, who must traverse a side-scrolling platform world littered with enemies and power ups. The goal of the game is to rescue the princess from an evil creature who has kidnapped her, but Mario keeps looking for her in the wrong castle.



Figure 34. Super Mario Bros. gameplay

4.3 Creating the Survey

As one of the main parts of this research, finding methods to quantify emergent narrative need to be discovered. This chapter will explain our process in the design of a Likert scale questionnaire to test for emergent narrative.

As has previously been stated, computer game narratives, in the vast majority, are inherently different from narratives presented in other traditional media, in the interactivity afforded by the medium and in that the story is presented and evolves around the reader. This is especially the case when dealing with *emergent*

narrative games. Therefore, trying to use traditional measurements of narrative might present difficulties and conflicts of meaning when measuring that.

Now, *emergent narrative*, is a difficult concept to work with, as it is a subjective entity that each individual reader will experience differently. As already stated in the background, measuring it is even more difficult. When trying to look at internalized narrative or emergent narrative, asking people to write or retell their descriptive narrative, (Pearce, 2004) will not necessarily gather the most useable data, as mentioned by both Calleja and Ryan. (Calleja, 2009) Furthermore, as explained in the chapter on storification, as soon as a story is told or expressed in another manner, and as soon as you ask a person to tell you a story, the internalized aspects of it will change. This change can be caused by choice of language, storytelling skill or storytelling methods. Additionally, when you ask a person to tell you a story that is exactly what they will do. The story could be analyzed and conclusions drawn from that but finding a method of quantifying emergent narrative seems like a much more suitable option. Another worthy consideration is that when creating an online questionnaire, which is likely to reach a multitude of nationalities; language skills and language interpretations would come into play as well.

Therefore, the questionnaire will need to look for instances of storification and at what causes *emergent narrative*. Our definition of emergent narrative needs to be broken down into what its basic ingredients entails, and look at its interdependence

Emergent Narrative Questionnaire

Based on the knowledge, previously gathered during the course of our studies, the background analysis and definition of emergent narrative, and our personal experiences, we formulated the following questions. These questions are a first attempt by us (and to our knowledge also a first attempt in the research community) to actually measure and quantify *emergent narrative*. Each question is listed below, alongside a description of the question and our reasons for including it.

The main points we will be looking for are either the players' need to break out of the perceived game rules, in order to experience his own narrative or strong indications of storification, and whether or not the game in question is offering the player the narrative freedom required to experience emergent narrative.

We want to ask if the player experiences any special kind of narrative, and if he feels ownership over that narrative. Also we want to ask about the players feeling of agency and control within the narrative system.

1. *While playing, I was more interested in creating my own goals than following the main objectives given by the game.*

The point of this question is find out if the player had the urge to go outside the path of the main story, if there is one, and experience the game world on his own terms (As much as the game allows). It is our belief that if the player got this urge fulfilled there is a stronger probability that something which could be perceived as *emergent narrative* might occur.

In our views this urge indicates that the player feels like experiencing other situations and events than those presented by the main storyline of the game. And this indicates that they identify, to some degree at least, with the character they are playing.

2. *While I was playing this game, I was more interested in experiencing the game world and creating my own objectives, than following the main or side quests/objectives in the game*

This question has a similar purpose to the previous question. It has a slightly different focus in its wording, but the purpose of both of them is to check if the player feels like she wants to do something else than what they might feel is expected of them in the game. It and the previous one, serves as double checks for each other and should supply an internal integrity check.

3. *The main character had different objectives than those presented in the main story*

Feeling that the main character had different objectives than those presented, indicates that the player is forming some sort of opinion about the character and building a personality for them (possibly injecting themselves into it). This could indicate that the player feels restricted within the game environment, but at the same time it indicates a narrative relationship forming between the player and the system.

4. *If given the option, I would have made different choices than my main character*

This question is also focused on narrative freedom. And so is an internal integrity check. This question focuses on whether or not the player would have acted differently in a given situation, if the option had been there. Again this indicates opinion forming and self-projection within the games system.

5. *My story was somehow special. I think I experienced a story that not many other people have experienced*

If a game can create scenarios for players that they feel are unique and do not happen for everyone playing the game, the game is essentially creating possibilities for the player experience *emergent narrative*. This question is a check of whether or not the player feels this is happening.

6. *I found myself thinking about how the main character would react in situations not presented in the game*

As previously mentioned we find immersion and presence to be big indicators of *emergent narrative* and this question is intended to give an indication of whether or not the players feel some level of immersion or presence.

Our understanding of *immersion* and *presence* will be explained in the Player Immersion Questionnaire section.

7. *I found myself thinking about the main character's background story, even information not presented in game itself*

Again we have included another double check question that should also indicate if the player is feeling some level of immersion or presence.

8. *On occasions I have found myself thinking about what I would do in the game, while not playing it*

If a player starts thinking about a game outside of playing it, it must be assumed that it has affected them emotionally in some way and this indicates that they are feeling some form of attachment and engrossment.

9. *While playing, I felt like my in-game decisions had no effect on the story I experienced*

This question checks if the players think they have a feeling of agency while playing the game. This is important, because if they do not feel this, then they do not feel that they can influence the story and this is an important aspect in our opinion. The question has been negatively formulated, so we can use it as a check for participants who have rushed through the questionnaire without reading the questions. The question is reverse scored in scaling the final answers.

10. *I feel strongly about my experience and would consider writing it up or talking about it to other people(either online, offline or both)*

The last question in the list looks for instances of storification, or a player's urge to express his experience in descriptive form. This question checks if they feel strongly enough about their experience to share it with other people. Therefore indicating a strong storification process, which the player has an urge to share with other people.

Game Mechanic Questionnaire

As Calleja puts it “*In order to develop a coherent and sustainable framework of narrative analysis to be used in the context of game environments the emergent narrative that LeBlanc, Salen and Zimmerman are referring to needs to be anchored in the game elements that generate such a narrative.*” (Calleja, 2013). We agree that the elements that generates the narrative need to be considered and to measure this we have created a questionnaire that, for each of the games we chose, lists the *game mechanics* that are present in the game and asks the participants to rate how they feel that each *game mechanic* has helped them to experience *emergent narrative*, based on our definition.

But what exactly is a game mechanic? We use the definition by Miguel Sicart (Gamestudies.org, 2008), which is as follow: Game mechanics are constructs of rules or methods designed for interaction with the game state.

This means that we include, not just specific actions (Like shooting a gun) but also aspects which are not directly linked to an action (e.g. the viewpoint of the player). The reason for doing this, is that we think some of the more vague aspects of a game can have a big impact on the narrative experience a player has.

Game mechanics are basically ways to activate different aspects of the game. In the Analysis chapter we will present a categorization of game mechanics that we feel is applicable to the topic of this paper.

To design a questionnaire to test the game mechanics, we would obviously have to categorize the game mechanics of all the games we have chosen. This is a daunting task in itself, as there are as many different versions of individual game mechanics as there are games. However, just as the games themselves fit into *families*, we fit the *game mechanics* into *families of game mechanics*. For example, even though the fighting mechanics are very different in games like DayZ (first person shooter) and RimWorld (top down simulation) they still involve eliminating your enemy with the weapons that are available.

This categorization is useful for classification of the *game mechanics* for the questionnaire, because it allows us to reduce the number of *game mechanics* to present. However, due to the vast difference in the implementations of individual *game mechanics* it does not make sense to base any analysis on the comparisons of implementations of *game mechanics*. Rather to see which *game mechanics* facilitate emergent narrative, in the way they are presented in the individual games. As we mentioned in the Background chapter, Ryan takes a similar stance on the narrative ingredients of games, and the analysis we will do on the results of the *game mechanic* questionnaire will be done on individual games and its *game mechanics*. For instance, we might be able to say that the *Combat game mechanic* in DayZ is a big

contributor to the *emergent narrative* the players of DayZ experience and that the implementation of it is very suitable to a game like DayZ. However we cannot say that the *Combat game mechanic* in DayZ is better at creating *emergent narrative* than the *Combat game mechanic* in Rimworld. They are vastly different, as are the games themselves, so any comparison would be almost meaningless.

We started out by going through the games, one by one, and listing all the main *game mechanics* that they offer. Once we had this list, we started a separate list containing all *game mechanics* and under each, listing the games that had these. See Appendix D for the final list.

We then set about writing a generalized, short descriptive text for each *game mechanic* that we could present to the participant, as we wanted to make sure that the participant was answering for our definition of the *game mechanic* and not their own understanding. This would be more likely to happen if we had given the names of the *game mechanics*, instead of the descriptive text we created. Wording for each *game mechanic* has been included in the table in Appendix D.

The game mechanics are what makes up the game mechanics questionnaire and they can be seen in Appendix D.

Player Immersion Questionnaire

As already mentioned, there exists a wide range of analysis methods which try to explain how players experience different aspects of the game experience. Here we discuss *immersion* as an important analysis tool which will become useful in analyzing the player experience further.

Immersion, where we use Calleja definition of *immersion*: “*immersion as transportation*” will be discussed here. (Calleja, 2011) This definition suggests that the player must not only be engaged in the game but also be in a world to be navigated. A world that is believable to the user. As Mel Slater suggests, the fidelity of the experience is going to have an impact on the *immersion* a reader experiences. (Slater, 2003) We do not believe that it is essential for the *immersive* experience but rather that it will support it and enhance it, if both are present.

The computer game industry, on the other hand, does not have the same issues with specificity. It does not care overmuch that the terms are a bit jumbled, but what can be said is that it has generally accepted *immersion as transportation* as the definition for *immersion*. The term is used in much marketing material and by many journalists and is touted as the next big milestone that many the modern games hope to achieve.

Therefore we will use a questionnaire, developed by Qin, Patrick Rau and Salvendy (Qin, Patrick Rau and Salvendy, 2009) that measures a player's *immersion*, which we view as a possible central element of *emergent narrative*, as previously discussed. An interesting aspect of this questionnaire, is that Qin, Patrick Rau and Salvendy created it to measure the narrative immersion of a player in a modern computer game, while taking into account the fact that *"The story includes the plots prewritten by game writers and developers..."* (Qin, Patrick Rau and Salvendy, 2009), but is also *"...Created by players in the course of playing the games."* (Qin, Patrick Rau and Salvendy, 2009). This means that they also view *emergent narrative* as an important part of the modern player's or reader's narrative experience.

Their final questionnaire design includes seven dimensions of narrative immersion or engaging behavior: Curiosity, Concentration, Challenge and Skill, Control, Comprehension, Empathy, Familiarity. Each of these dimensions have a number of questions in the questionnaire directly related to them, so each evaluated game can be rated on how immersive or engaging it is and be compared to other games. Qin, Patrick Rau and Salvendy state that their questionnaire is not limited to any particular game genre, but on the other hand they also say *"It is applicable to story-oriented games except for chess and board games."* (Qin, Patrick Rau and Salvendy, 2009)

Narrative Transport Questionnaire

We do not believe, as Jesper Juul (Juul, 2001) does, that it is not possible to have interactivity and narration at the same time. We are more inclined to take the same approach as Calleja (Calleja, 2009) does in his paper *Experiential Narrative in Game Environments*. He states that *"Interaction generates, not excludes story"*. And in this case, we must take a look at the process a reader goes through when getting absorbed in the story.

For additional data analysis, and based on Calleja's definition of immersion as being transportation, we started looking into literature theory that measures narrative transportation. The reasoning for this was twofold. First we wanted to see how a questionnaire specifically designed for literature and therefore a highly linear medium, would translate into the context of games. Secondly, we wanted to if see narrative transportation, as something linked to immersion, according to Calleja, is in any way connected, or disconnected from the emergent narrative experience.

Narrative Transportation as a concept was first described, in the context of novels, by Richard J. Gerrig as *"Someone ("the traveler") is transported, by some means of transportation, as a result of performing certain actions. The traveler goes some distance from his or her world of origin, which makes some aspects*

of the world of origin inaccessible. The traveler returns to the world of origin, somewhat changed by the journey,” (Gerrig, 1993). What this means is, that a reader of a narrative may become so engrossed or absorbed in the narrative that they miss events taking place around them. They might, for example, miss that a person entered and left the room they are in, if they are deep enough into the story, both on a physical level and also on a psychological level. Additionally the reader may also experience strong emotions. Both of these phenomenon may occur, even though the reader is fully aware that the events in the narrative are not real.

A last phenomenon that can happen to a reader, if she becomes absorbed in the story is that, the story may affect her and change her beliefs or attitudes.

Melanie C. Green and Timothy C. Brock, have developed a questionnaire that can measure this transportation that a reader might experience, in their paper *the role of transportation in the persuasiveness of public narratives* (Green and Brock, 2000). This questionnaire has been designed to test the strength of the narrative transportation that a reader has and we intend to use this in conjunction with other questionnaires to examine the narrative experience a player of a computer game has. It was tested by the authors, during the development process, on two written narratives. Both of these narratives were involving and emotionally impactful. So while, this questionnaire is not directly developed for use on interactive narratives, we still find it applicable.

One point that Green and Brock make in this paper is that “*Characters may play a critical role in narrative-based belief change.*” They are talking about how important characters’ credibility in the narrative are to the reader, in regards to forming of attachments, which can be an important part of the persuasiveness of a story. As they say “*Readers may not only enter a narrative world, they may also become highly involved with the people they find there.*”

At the same time it is important to note that, as with many other theories, not every individual is equally affected by narrative transportation (Green and Brock, 2000). This can be dependent on many things, both personal and situational.

As previously discussed, we think that being transported into a narrative could have some influence on the *emergent narrative* experience the reader has, but we are not convinced that the player needs to be highly transported for her to experience *emergent narrative*. Using the Narrative Transport Questionnaire, we will try to measure what effect *narrative transportation* has on *emergent narrative* and thereby examine the relationship.

Player Types

In addition to the questionnaires mentioned above, we decided to include an player type check for those of the test subjects interested in taking it. Considering the current length of the survey, we did not want to include this as a requirement but rather as an additional data collection method for further analysis, if enough people would participate.

The player type test we chose to use was the Bartle test. The Bartle test is used to classify between player types in MMO games, as being explorers, socializers, killers or achievers and is based on work done by Richard Bartle in 1996. (Bartle, 1996) The Bartle test is the biggest online test we could readily find, which offered an interesting experience for the test subject while participating. But the Bartle test has had its fair share of criticism throughout the years, with many people either working from on top of it to design better classification, or criticizing it as being badly formulated. The main reason we used this method instead of any other was because it required no extra work on our part to include it. And with 800.000 answers, on the hosting site, it can serves more as a conversational and comparative method than an foolproof analysis on how to measure user types, and secondly it is the only player type method that we could find which has an online website we could point to and gather data from in our survey.

Another method would have been digging further into the research done on player classifications where we could have found and implemented a better questionnaire, but because of time constraints and the already expansive size of the questionnaire, we decided that this would include less manual labor while still offering a chance for classification and comparison between the different groups.

4.4 Research Questions

To guide our research, we here elaborate on the research questions posed in the background. We attempt to define them more sharply, so that we can answer them with the results we generate with our survey. Below we have transformed each of the research questions from the Background into more pointed versions and then below these, we create corresponding null hypotheses, to be answered in the Discussion.

Primary research question:

- *How can we create a questionnaire that can measure the Emergent Narrative experienced by players, based on our definition of it?*
 - Can we create a questionnaire that can measure the Emergent Narrative experience that players have based on our definition of it?

Secondary research question

- Is there a relationship between the Emergent Narrative experience a given player has and the Narrative Transport?
- Is there a relationship between the Emergent Narrative experience a given player has and the narrative player immersion?

Additional research question:

- Can we create a questionnaire to measure how game specific mechanics help the player experience Emergent Narrative?
 - Which game mechanics are most helpful to the process, if players experience Emergent Narrative?

4.5 Null Hypotheses

Primary null hypotheses:

1. *There is no significant difference between the emergent narrative experiences measured with the designed questionnaire, across the nineteen chosen games.*
2. There is no significant difference between the emergent narrative experience measured, and the self-reported emergent narrative.

Secondary hypotheses:

1. There is no significant difference between the emergent narrative experience measured, when comparing it to the narrative transportation
2. There is no significant difference between the emergent narrative experience measured, when comparing it to player immersion

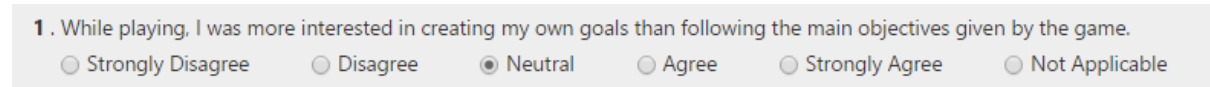
5 Method

In the method chapter the process of the survey design will be explained, how it was implemented and the pilot test conducted. Furthermore the method of conducting the test will be explained.

5.1 Research Method

For the quantitative data collection, an online survey was created, and published online on www.nrim.dk.

All four main questionnaires collect data using a Likert scale ranging from strongly disagree to strongly agree. After the conduction of the pilot test a not applicable option was added to the end of the scale. (Explained further in the pilot test section). See figure 35.



1 . While playing, I was more interested in creating my own goals than following the main objectives given by the game.

☐ Strongly Disagree
 ☐ Disagree
 ☒ Neutral
 ☐ Agree
 ☐ Strongly Agree
 ☐ Not Applicable

Figure 35. A question as presented on the survey site

Each independent questionnaire contained more than four Likert types, which gave the option of measuring them as independent Likert scales, instead of basing the results on the Likert types. The answers could therefore be summed up for each individual person, giving them a scale, or a score for their experience in that field of study.

The ordering of the questionnaires was important. Each page contained a questionnaire in its entirety, and after a test subject finish a particular page, the data would be saved.

The first page listed the emergent narrative questionnaire. It was expected that a certain amount of participants would drop out as the survey progressed and we saw this as the most important questionnaire needed to answer the first part of our research question.

The second page contained the narrative transport questionnaire, and the third contained the biggest questionnaire, the player immersion.

The game mechanic questionnaire was placed as the fourth and last main page of the survey. There, the test subjects would receive specific questions dependent on the game that they had chosen. Although we would have liked to receive more answers on that page, which we would have done by placing it sooner in the ranking, it was more important to place it last because of the nature of the questions.

The game mechanics questionnaire explains emergent narrative to the test subject and asks for their opinion, on if they have experienced emergent narrative. It asks for their objective opinion on which game mechanics helped them experience this. Placing it last was important so it would not affect the answers given in the first three questionnaires.

After finishing the last questionnaire. The user was presented with a demographic page asking them about their name and email(both optional) for the purposes of the prize pool, nationality, gender, age, average number of hours playing computer games weekly (text box, open input) and an estimate of how many hours they have played the given game (interval selection, see Survey Design)

Screenshots of the whole survey and the way they were presented to the test subjects can be seen in the Appendix C

5.2 Population and Sample Frame

The population that we are attempting to investigate with this survey is the “gamer” population across the globe. This population, conceivably, contains all ages, genders and nationalities. However we do have certain assumptions about the population. We expect the population to be overwhelmingly male, with a majority being in the age range 15-30. We have no real expectation of the population in terms of nationality or ethnicity.

The original sample we are testing on is the subscribers of the subreddits for the games we chose to include in the survey. We assume that the makeup of this sample is very similar to the general population we are testing on, with the exception that it will mostly be from the United States of America and other western countries, due to the fact that we are posting on a, mostly, English speaking website. The final sample will consist of the reddit users who saw our post and actually participated in the survey. The demographics of the final sample will be shown in the Results chapter.

Privacy Policy

On the website, we included a page with our privacy policy, which can be seen in the appendix (See Appendix E).

5.3 Survey Implementation

The actual implementation of the survey was a website, created in Microsoft's ASP.NET MVC with the help of Visual Studio 2013, using a MySQL database as storage for the results. The implementation is built around the two surveys, created by Green & Brock and Qin, Patrick Rau & Salvendy and the two surveys created by us, as discussed above.

The implementation presents each of the four surveys, to the user, on a separate page. Between each page, the user's choices, along with her UserID and GameID, are saved to the database. This ensures that the data is collected as soon as possible, to minimize any data loss, because of dropout. Any duplication of data that happens because of this, for example if the user goes back a page, changes her answers and the proceeds again, can easily be sorted out of the data (See "Data clean up and pretreatment" in the Results Chapter for greater detail on the data cleaning process).

After the four surveys, the user was asked to provide some demographical information, as described above. Then the user was asked to take the Bartle test, and enter their results. However the authors tried to make it visible that this part of the survey was completely optional.

One unfortunate difficulty with the Bartle test, is that the site, on which it is hosted, lists the results in descending order (e.g. Socializer: 85 Achiever:70 Killer:53 Explorer:45), as it then gives people a title, based on their results, in this case SAKE, and a description of their Gamer Personality. This means that the order of the boxes listed on the survey site, would more often than not, be in a different order, potentially leading to some confusion. In an effort to try to alleviate this problem, a line of red text was placed just above the boxes where the user would input their results, stating "*Be aware that the boxes might be ordered differently. That is the Bartle site, listing your results in descending order.*"

At the very end of the survey, the user was presented with a checkbox, indicating if they would be interested in receiving an email from the authors, after the project completion, with a compilation of the results.

5.4 Pilot Test and Changes

After creating the survey, we conducted a pilot test to see how people would respond to the survey. Ten people participated in the pilot test. These people were chosen based on their resemblance to the research population. All of the pilot testers are gamers with university degrees, so we expected an informed opinion on how such a survey should and could be conducted in the best possible manner. They did not receive any additional explanations or clarifications other than those presented on the survey site, but given our personal

relationship with most of them, many had some knowledge of the concept. Furthermore they were asked to time how long it took them to go through the whole survey.

During the creation process of the survey, we decided that the survey should not take much more than ten minutes for the average participant to complete, excluding the player type questionnaire. We therefore asked our pilot testers to time their progress, in order to decide whether or not to exclude any of the data collection methods. The average test participant took approximately 13 minutes to finish the survey (excluding the last player type test) with the extremes being 8 and 20 minutes. Although this exceeded our ten minute mark, we decided not to exclude any of our analysis methods from the final survey.

An important change that was done on the survey, was that based on the feedback, a Non Applicable option was added, to each of the Likert scale questions. The testers perceived some of the questions as not fitting to their experience in the game they chose. Some of them then asked if they should answer them neutrally or as strongly disagree. We saw this as a potential noise creation problem, for the final analysis of the data, so that option was added for what we expected to create clearer measurements.

5.5 Conduction of Test

To recruit participants for the survey, we posted a short message on twenty subreddits on Reddit.com (Reddit.com, 2015), asking for help, in exchange for the chance to win one of eight gift cards to the digital game distribution service Steam (Steam, 2015). A link to the posts can be seen in Appendix B

We posted the following message on subreddits, concerned with the games we had decided to include in the survey, adjusted to each individual subreddit and game. As can be seen we tried to reveal as little as possible, about the actual purpose of the survey, to avoid any creating biasing, while still trying to give some information about what the survey was about.

Title of post:

“Hey /r/Minecraft. Could you help us finish our master thesis? In exchange we want to give away 300\$ worth of gift cards on steam.”

Content of post:

“Hey [/r/Minecraft](#).

Method

We are two guys from Denmark and Iceland, working on our master thesis on interactive media and games. We need help from as many of you as possible in order to finish up our research. We can't go into too much detail about it as it might skew our results, but in short we are looking into interactive narrative experiences in games and how they could be improved and re-innovated.

As a thank you for the help, we've managed to get 300\$ to give away as prizes. They will be split between the eight luckiest test participants, in the form of gift cards on steam. 1x100\$ 2x 50\$ and 5x20\$. The winners will be picked at random from those that participated on the 15th of June, from all the different subreddits and forums we have asked for help.

To participate please go to <http://www.nrim.dk> , pick Minecraft or any other game you have been playing most recently and take the survey. It should take about 12-15 minutes.

We greatly appreciate any help you can give us!"

Approximately a week before we started posting on these subreddits, we contacted the moderators of the chosen subreddit to ask their permission to post this survey to the subreddits, and to hear if they could help us in any way. This is not standard practice when posting on these forums, since all content related to the topic of the subreddit are normally allowed. But we wanted to get them on board, and possibly try to elicit any help or feedback from them in gaining attention to the survey.

Most of the moderators responded positively to our request and were interested in the project.

All the moderators that answered our message, 17 out of the 20 contacted, gave us their permissions to post it, some wanted to review the study first which we allowed, and one moderator suggested we waited until 8 am EST, to post anything, since that is when the reddit community in the United States, which is the biggest part of Reddit's user base, would start to come online. This would guarantee us the greatest exposure, so we followed that advice.²

² Reddit has a system, where posts can be up or down voted by the users. This results in the more popular being ranked higher and thus displayed on the "FrontPage" of the subreddit, and the more unpopular disappearing in the crowd of posts.

Method

A handful of the moderators even offered to “Sticky”³ the post for us, four in total. The great difference in answers for the different games can be traced back to whether or not the post got stickied. The survey post on the Skyrim subreddit remained stickied for the whole three weeks, which also accounts for our greatest number of answers. This and the size of that particular subreddit explains the much higher amount of answers received for that particular game.

After the Pilot test and the resultant adjustments, we chose to divide the subreddits up in to three chunks and post to each of these chunks on separate days. This was mostly done for our own convenience, so we could keep up with replies to the subreddits and answer any questions/concerns/comments that were posted on them. The first chunk contained eight subreddits and would reach a little more than a third of the total potential readers. The second chunk was intentionally kept a little smaller, so we could gauge the response of the population. It contained five subreddits, but would only reach about 15% of the total population. The last chunk also contained five subreddits, but would reach around 45% of the population. Thus we saved most of the population until the last day, so we would have had a chance to see how people reacted to the post and the survey. The total number of subscribers to all the subreddits combined is approximately 1.5 million people. The following three weeks we spent a good portion of our time answering comments on all the posts on the subreddits.

³ A stickyed post, is displayed right at the top of the FrontPage of the subreddit and is highlighted in this way. The users also know that this post has been approved by the moderators, lending it a certain inherent weight/popularity.

6 Results

In this chapter we will be showing the main results of our survey and the analysis we have done on the data. In the following the four questionnaires will be mentioned by their initials, like this: Emergent Narrative (EN), Narrative Transport (NT), Player immersion (PI) and Game mechanics (GM).

6.1 Data Clean Up and Pretreatment

All in all, we started collecting data on the 21st of May and downloaded our final data for analysis on the 11th of June, having had the survey open for 3 weeks. By the end of the third week of data collection, we were still getting a number of replies (~50/day), however, due to time constraints and due to the fact that this was a small percentage (~0.5%) compared to the total number of participants, we decided to collect the data and start our analysis of it. The site remains up and is still collecting data. As of the 28th of June 2015, approximately 500 additional answers have been gathered that will not be included in the data analysis for this paper.

6.2 Data - The Numbers and Validity

After collecting the data we started verifying and cleaning the data. As previously mentioned, the survey is a combination of four different questionnaires (+ plus one optional section), presented to the user in the order already discussed. Therefore it is quite reasonable to assume that some participants will drop out of the survey part way through. We have listed the numbers for each section of the survey separately, to make it easier to get a picture of the number of participants and their drop-off rate.

Table 3 shows the numbers of the clean-up process and the final count and a percentage of answers based on the total number of participants that answered the first page.

In order to clean up the data, four properties needed to be looked at before any meaningful analysis could be done. Because the Likert questions were set up so that Neutral was preselected, we removed, from each questionnaire's dataset, all participants who only had Neutral answers. Additionally, as previously discussed, we had to remove duplicate answers.

Results

Clean-up	Raw	Nulls	Duplicates	N/A	Extremes	Final Count	%
EN	14259	257	246	195	14	13547	100
NT	12352	514	133	21	6	11678	86
PI	10722	444	130	2	n/a	10146	75
GM	10292	473	376	n/a	n/a	9443	69
Bartle (Optional)	n/a	n/a	n/a	n/a	n/a	5220	39

Table 3. Table showing the amount of answers, and the results of the cleanup process

And as we are making Likert scales out of each participant's answers, we had to make sure each answer set had at least four answers. If a person had answered with N/A for more than the total number of questions - 4, we excluded those answers, for that particular questionnaire's data. The last thing to check in the datasets, is if there are any extremes (i.e. people who only answered, either, strongly disagree or strongly agree). These answers are most likely from participants who only wanted to participate for the chance to win one of the prizes. We could obviously only check this, if the questionnaire has one or more reverse scored questions, which our own EN questionnaire and the NT questionnaire had. For the player immersion, which has no negatively worded questions, this could not be checked, but by looking at the data, the potential extremes, are 11 out of the 10.722 answers, or 0.1% of the whole dataset. This should therefore have no significant effect on the final results.

This cleaned up and validated data was used for the following statistical analyses.

Note that we have excluded two of the arcade games (Donkey Kong and Space Invaders) and one of the modern games (This War of Mine), as their response rate was below our inclusion threshold of 75 responses (7, 1 and 63 respectively) at the Player Immersion Questionnaire.

Although Super Mario Bros. is technically below the threshold too, we decided to still include it because it was the arcade game we got the most responses for. It will mostly be for the sake of comparison, we will not be basing any conclusions or statements on it.

6.3 Data - Scales

We created a Likert Scale for of the EN, NT and PI questionnaires for each game. This was done by taking the results for each game and giving each participant a score (the mean of all questions answered with anything but a Not Applicable). Thus each person's Likert Scale score is an appropriate representation of all their answers for each of the first three questionnaires. Additionally the PI questionnaire has a number of dimensions (each question belongs to a certain dimension) created by the authors of the questionnaire; each dimension was given a mean, for each game, of the answers of the questions of the given dimension. This will be used later on to determine if there is any particular part of the measurements of the PI questionnaire that have relationship with *emergent narrative*.

Additionally we performed the calculations again on a smaller sample (75, as that is the lowest number of usable answers for one of the games, in the smallest questionnaire sample) and we have included these numbers in separate tables and graphs below, where applicable.

The Game Mechanics questionnaire we treated a little differently. There we were interested in each individual game mechanic and its perceived influence on the narrative experience of that game. For each *game mechanic*, in each game, a mean was calculated. In this way we get a picture of how important each game mechanic is to the player's experience of *emergent narrative* in that game. Additionally a mean was calculated for each game mechanic across all the games that have it, to get a picture of whether or not the game mechanic, as a design consideration, could be influential on the emergent narrative experience.

However, one very important question we ask in the GM questionnaire, is if the players themselves, think that they have experience *emergent narrative*. This will be useful, when looking for patterns in the data and this question was not included in the *game mechanic* data pretreatment described above. This question we treated separately, by giving each game a mean of the answers for this question for the game. This will give us a picture of how much the players themselves think they have experienced *emergent narrative* while playing that particular game.

6.4 Data - Normality

The first test we performed on the data was to test for normality. This would determine which kind of tests we would be performing, to test our hypotheses.

Results

To test for normality we utilized the Shapiro-Wilk test, which uses the null-hypothesis principle to test for normality, with an alpha of 0.05. It was performed on the Likert scale for each game, for EN, NT and PI. Table 4, below shows the values for this test for each of the games, for EN, NT and PI.

<i>Alpha = 0.05</i>	Minecraft	Skyrim	DayZ	EVE	M&B	Arma	CK2	EU4	The Sims 4
EN - P Value	2,4978E-12	0	1,19E-05	1E-07	5E-06	0,102872	0	0	1,4587E-06
Sig	no	no	no	no	no	yes	no	no	no
NT - P Value	0,12961955	1,45E-08	0,231007	0,2741	0,03617	0,318915	0,047	0,0083	0,11108589
Sig	yes	no	yes	yes	no	yes	no	no	yes
PI - P Value	0,00012277	1,67E-08	0,466208	0,59	0,03517	0,690281	0,465	0,0017	0,21496735
Sig	no	no	yes	yes	no	yes	yes	no	yes
	Civ 5	TW:R2	Rim-world	Bio-shock	BF4	Far Cry 4	Spelunky	Super Mario	
EN - P Value	1,9857E-12	3,42E-05	2E-07	0,01766	0,021893	0,142	0,0994	0,21514279	
Sig	no	no	no	no	no	yes	yes	yes	
NT - P Value	0,00121228	0,403517	0,357	0,00661	0,184109	0,125	0,5107	0,45193465	
Sig	no	yes	yes	no	yes	yes	yes	yes	
PI - P Value	0,38271184	0,25063	0,6169	0,11466	0,000771	0,987	0,6248	0,75643683	
Sig	yes	yes	yes	yes	no	yes	yes	yes	

Table 4. Shapiro-Wilk results - Test for normality

Results

As this table shows, some of the P-Values are above the alpha, indicating that some of these samples are not normal distributed. Now the Shapiro-Wilk test is sample-size biased, meaning that the larger the sample, the more likely it is that the test will indicate a significant difference. Using this test in conjunction with a Q-Q plot is the normal method of confirming the significant difference, indicated by the test. To test that we created a few example Q-Q plots to visualize the data.

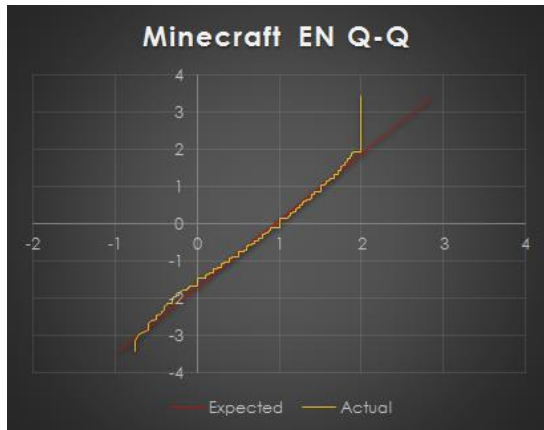


Figure 36 Figure text Q-Q plot of Minecraft's EN data.

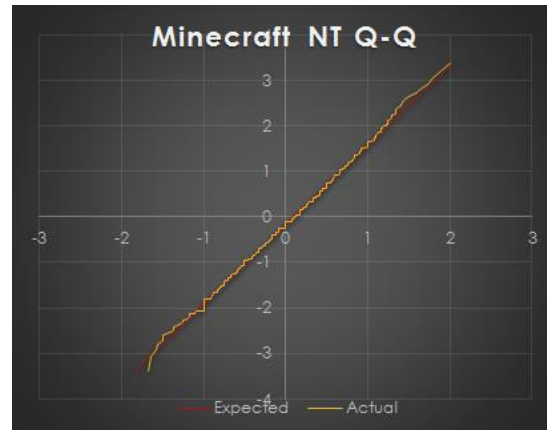


Figure 37. Figure 36 B. Q-Q plot of Minecraft's NT data

The Q-Q plots show the data plotted against its expected normal distribution. This means that if the actual data line lies close to the expected data line, it is probably normal distributed and if it does not, then it is probably not normal distributed. Figure 36 shows the *Emergent Narrative* questionnaire data for Minecraft and this is clearly not normal distributed. Figure 37, on the other hand, shows the *Narrative Transport* questionnaire data for Minecraft and this is clearly normal distributed. So this further reinforces the previous normality tests.

Additionally, to double check the results of the Shapiro-Wilk Test, we also plotted histograms of the data. Again we did not find it relevant to draw all of them and we have shown two here.

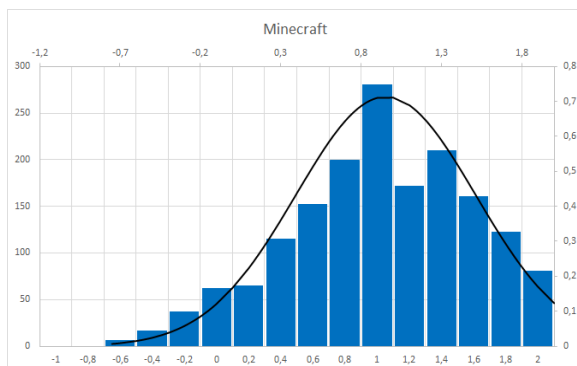


Figure 38. Histogram of Minecraft's EN data

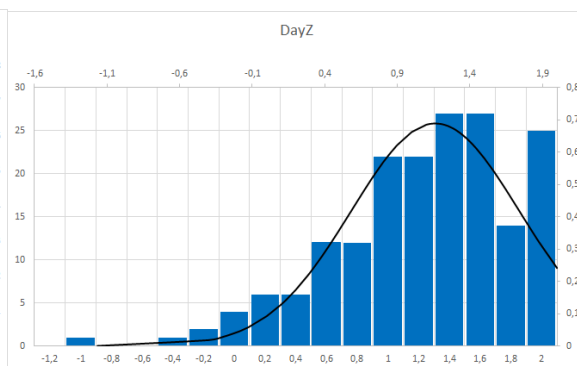


Figure 39. Histogram of DayZ's EN data

Results

This also shows that the data set is not normal distributed in all cases.

This does mean that we can safely assume that the data is not normal distributed and hence use non-parametric statistical methods to test the hypotheses, specifically we will be using the Mann-Whitney U test later on.

In the next section we will start looking at the actual data and the results of the investigation. The very first thing looked for was, if there were any obvious patterns in the Likert scale means for EN, NT and PI, along with the means of the self-reported *emergent narrative*(Self EN) from the question in the GM questionnaire.

The indications and results described below will all be elaborated on in the Discussion chapter.

6.5 Rankings

To look for patterns in the data, the results of the Likert scales was ranked, with the highest scoring game on top. In this way we could get a quick glance at the overall results of the investigation.

The first list ranks the mean score of the *emergent narrative* Likert scale for each game, with the highest value showing the highest agreement rating. See tables 5-6

Performing the same ranking on the *narrative transport (NT)* and the *player immersion (PI)* scales gives us the following tables. See tables 7-8

Emergent Narrative Scale - Full Population			Emergent Narrative Scale - 75 samples		
Game	Mean	SD	Game	Mean	SD
Crusader Kings 2	1,274	0,47	Eve Online	1,305	0,508
Europa Universalis 4	1,261	0,51	Crusader Kings 2	1,285	0,471
Eve Online	1,242	0,54	RimWorld	1,265	0,505
RimWorld	1,199	0,53	Europa Universalis 4	1,217	0,454
DayZ	1,161	0,58	DayZ	1,189	0,572
Total war: Rome II	1,058	0,56	Civilization 5	0,982	0,543
Minecraft	0,953	0,56	Total war: Rome II	0,950	0,596
Civilization 5	0,933	0,61	The Sims 4	0,938	0,544
The Sims 4	0,885	0,56	Minecraft	0,907	0,579
Mount & Blade Warband	0,883	0,58	Mount & Blade Warband	0,820	0,660
Skyrim	0,721	0,53	Skyrim	0,706	0,544
Arma 3	0,641	0,67	Arma 3	0,604	0,637
Far Cry 4	0,404	0,52	Bioshock infinite	0,346	0,510
Bioshock infinite	0,343	0,52	Far Cry 4	0,329	0,530
Spelunky	0,204	0,79	Spelunky	0,209	0,824
Battlefield 4	0,003	0,67	Battlefield 4	-0,041	0,683

Table 5 Mean and standard deviation of entire population for EN data

Table 6 Mean and standard deviation of random 75 sample for EN data

Results

Narrative Transportation Scale - Full Population			Narrative Transportation Scale - 75 samples		
Game	Mean	SD	Game	Mean	SD
Bioshock infinite	0,839	0,47	Bioshock infinite	1,275	0,35
Eve Online	0,577	0,55	Europa Universalis 4	1,012	0,37
DayZ	0,487	0,49	Eve Online	0,996	0,43
Europa Universalis 4	0,484	0,48	Crusader Kings 2	0,949	0,39
Crusader Kings 2	0,476	0,45	The Sims 4	0,925	0,40
Total war: Rome II	0,450	0,48	Civilization 5	0,894	0,36
Arma 3	0,433	0,48	Total war: Rome II	0,776	0,42
Civilization 5	0,407	0,51	DayZ	0,738	0,44
RimWorld	0,403	0,45	Arma 3	0,734	0,43
The Sims 4	0,400	0,54	Mount & Blade Warband	0,656	0,40
Skryim	0,356	0,50	RimWorld	0,644	0,38
Mount & Blade Warband	0,266	0,48	Battlefield 4	0,529	0,45
Far Cry 4	0,242	0,49	Far Cry 4	0,473	0,44
Minecraft	0,099	0,57	Skryim	0,448	0,55
Battlefield 4	0,008	0,54	Minecraft	0,093	0,57
Spelunky	-0,100	0,57	Spelunky	0,002	0,54

Table 7. Mean and standard deviation of entire population for NT data

Table 8. Mean and standard deviation of random 75 sample for NT data

Player Immersion Scale - Full Population			Player Immersion Scale - 75 samples		
Game	Mean	SD	Game	Mean	SD
Bioshock infinite	1,015	0,37	Europa Universalis 4	1,165	0,38
Europa Universalis 4	0,963	0,38	Bioshock infinite	1,019	0,36
Eve Online	0,931	0,42	Eve Online	0,958	0,38
Civilization 5	0,909	0,37	Crusader Kings 2	0,926	0,41
Crusader Kings 2	0,895	0,36	Civilization 5	0,908	0,34
The Sims 4	0,883	0,40	Total war: Rome II	0,907	0,39
DayZ	0,865	0,40	Arma 3	0,878	0,42
Skryim	0,860	0,39	DayZ	0,847	0,40
Total war: Rome II	0,828	0,42	The Sims 4	0,845	0,42
Arma 3	0,765	0,46	Skryim	0,814	0,50
RimWorld	0,748	0,41	Mount & Blade Warband	0,760	0,40
Minecraft	0,703	0,48	RimWorld	0,702	0,42
Far Cry 4	0,679	0,45	Minecraft	0,680	0,44
Mount & Blade Warband	0,664	0,42	Far Cry 4	0,655	0,45
Spelunky	0,489	0,50	Battlefield 4	0,629	0,47
Battlefield 4	0,402	0,54	Spelunky	0,489	0,50

Table 9. Mean and standard deviation of entire population for PI data

Results

Table 10. Mean and standard deviation of random 75 sample for PI data

As stated earlier one of the questions in the *game mechanics* questionnaire, is actually not related to the game mechanics of the games, but is a question that asks the participants if they think they have experience *emergent narrative*, based on our explanation of it. Below is the table with the means of that question for each game.

Self reported Emergent Narrative - Full Population			Self reported Emergent Narrative - 75 samples		
Games	Mean	SD	Games	Mean	SD
Arma 3	1,145	0,37	Eve Online	1,773	0,535
Battlefield 4	-0,159	0,41	Skyrim	1,547	0,793
Bioshock infinite	0,062	0,16	Crusader Kings 2	1,467	0,935
Civilization 5	1,237	0,16	Europa Universalis 4	1,453	0,859
Crusader Kings 2	1,645	0,21	DayZ	1,373	0,969
DayZ	1,625	0,14	RimWorld	1,373	1,024
Europa Universalis 4	1,458	0,29	Minecraft	1,333	0,949
Eve Online	1,710	0,88	Mount & Blade Warband	1,227	1,034
Far Cry 4	0,796	0,33	Civilization 5	1,227	0,781
Minecraft	1,095	0,40	Total war: Rome II	1,160	1,295
Mount & Blade Warband	1,295	0,41	The Sims 4	1,077	1,089
RimWorld	1,382	0,40	Arma 3	1,053	1,224
Skyrim	0,999	0,49	Far Cry 4	0,720	1,060
Spelunky	0,250	0,28	Spelunky	0,387	1,384
The Sims 4	1,077	0,20	Bioshock infinite	-0,173	1,298
Total war: Rome II	1,317	0,27	Battlefield 4	-0,333	1,464

Table 11. Mean and standard deviation of entire population for self-reported EN data

Table 12. Mean and standard deviation of random 75 sample for self-reported EN data

Results

Here we present a table, where each game has been ranked in each of the four categories, with rank number 1 being the best rank (and highest score in that category) and rank 16 being the worst (and lowest score in that category). Note that the games are ordered alphabetically in this table and that it only shows the full population results.

Games	EN-mean	NT-mean	PI-mean	GM_EN
Arma 3	12	7	10	9
Battlefield 4	16	15	16	16
Bioshock infinite	14	1	1	15
Civilization 5	8	8	4	8
Crusader Kings 2	1	5	5	2
DayZ	5	3	7	3
Europa Universalis 4	2	4	2	4
Eve Online	3	2	3	1
Far Cry 4	13	13	13	13
Minecraft	7	14	12	10
Mount & Blade Warband	10	12	14	7
RimWorld	4	9	11	5
Skyrim	11	11	8	12
Spelunky	15	16	15	14
The Sims 4	9	10	6	11
Total war: Rome II	6	6	9	6

Table 13. Ranking of EN, NT, PI and Self EN data

This table is mostly here to help provide an overview of the data and the relationships between the datasets for each game.

6.6 Results - Game Profiles

We wanted to give each of the tested games a profile of sorts, based on all our results. This was done, simply by stacking the results of each the former ranking tables on top of each other, for each game. The following graphs displays the games and their profile. The first graph shows the magnitude of all the numbers, while the second gives a percentage based view. The third shows a percentage view of the profiles, without the EN component. They are ranked by the game's self-reported emergent narrative score.

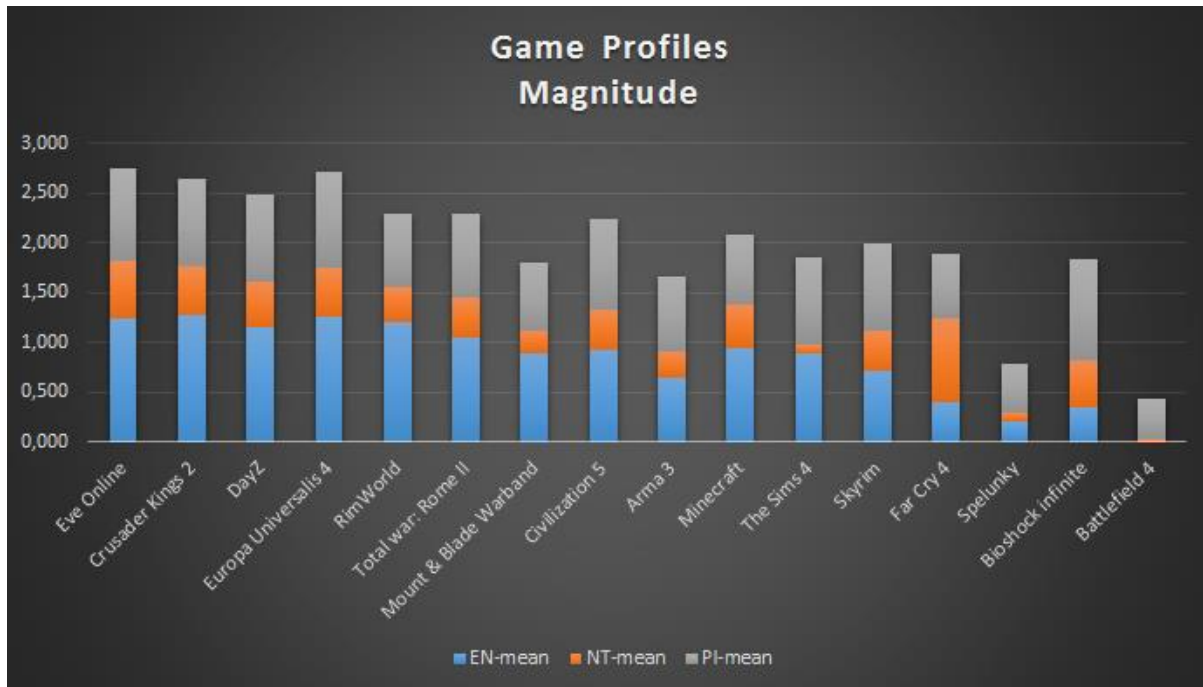


Figure 40. Graph showing magnitude of Game Profiles, ranked according to Self EN, highest being on the left

Results

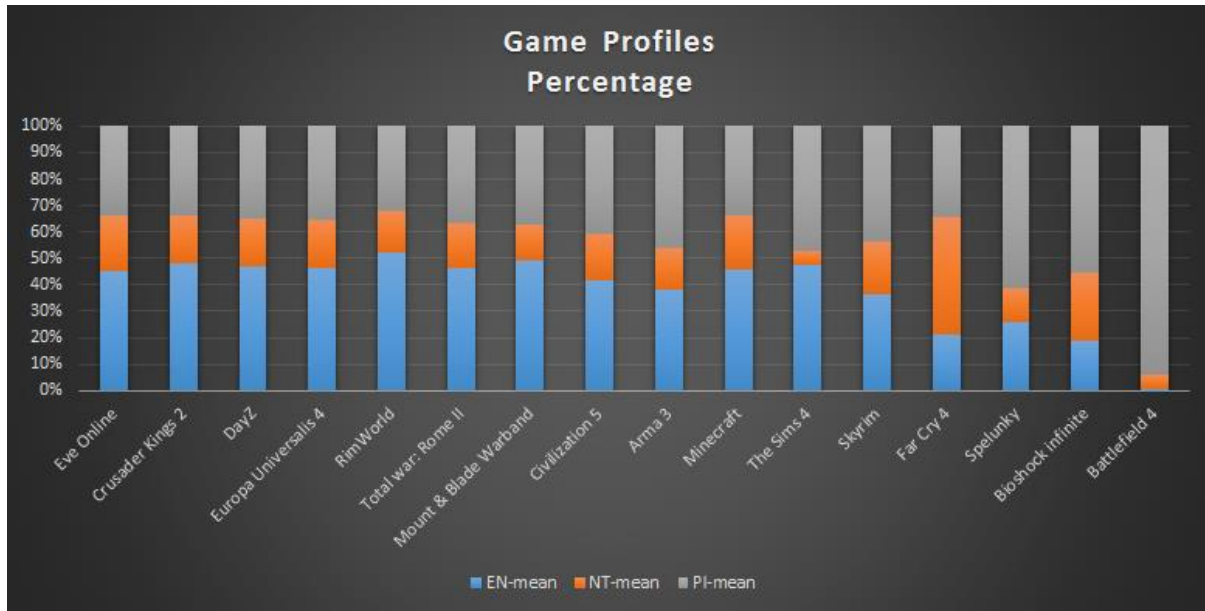


Figure 41. Graph showing percentage view of Game Profiles, ranked according to Self EN, highest being on the left

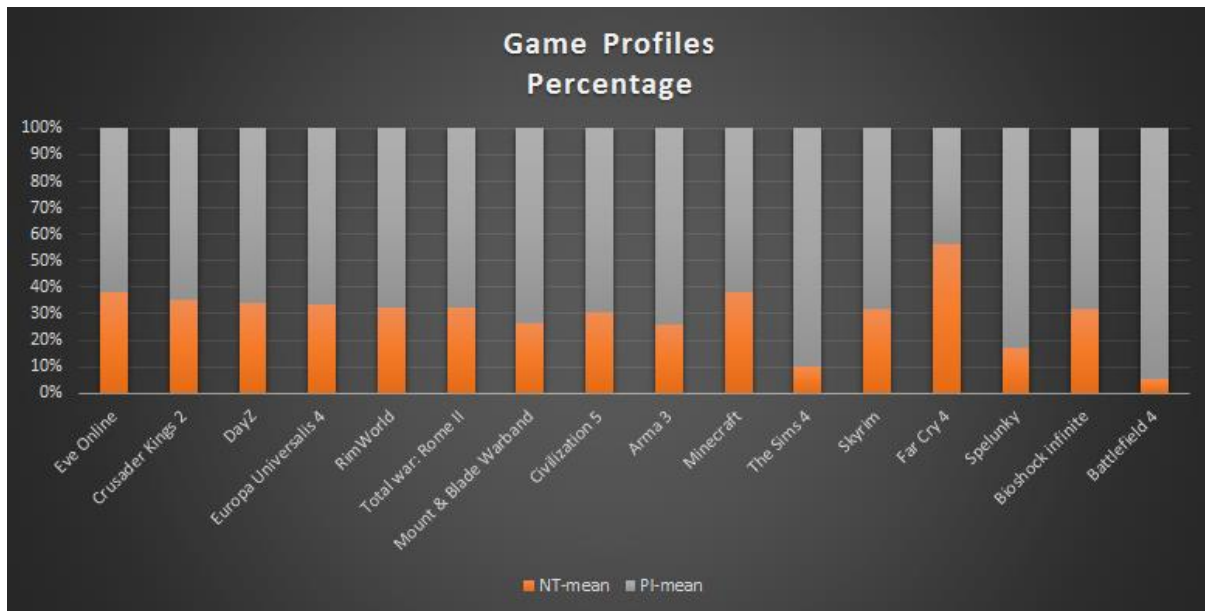


Figure 42. Graph showing percentage view of Game Profiles, ranked according to Self EN, highest being on the left. EN component is not shown.

6.7 Results - PI Dimensions

This graph shows the results of the PI questionnaire broken down into the dimensions, that the original authors of the questionnaire created. The games are ranked according to their self-reported emergent narrative, just like the previous graphs.

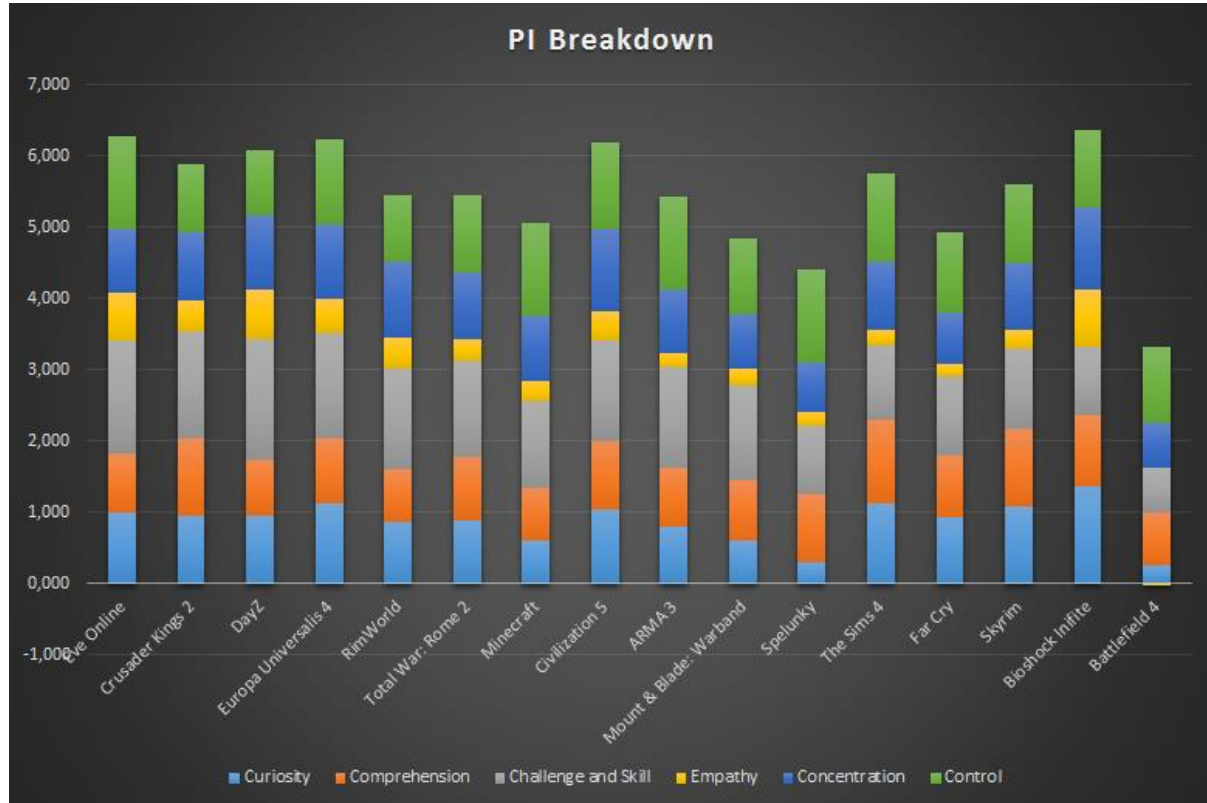


Figure 43. Graph showing PI dimension breakdown, ranked according to Self EN, highest being on the left.

6.8 Results - Game Mechanics

As stated in the Method chapter the game mechanics questionnaire data was treated a little differently. Below is a graph of the means of the medians of the game mechanics across all games.

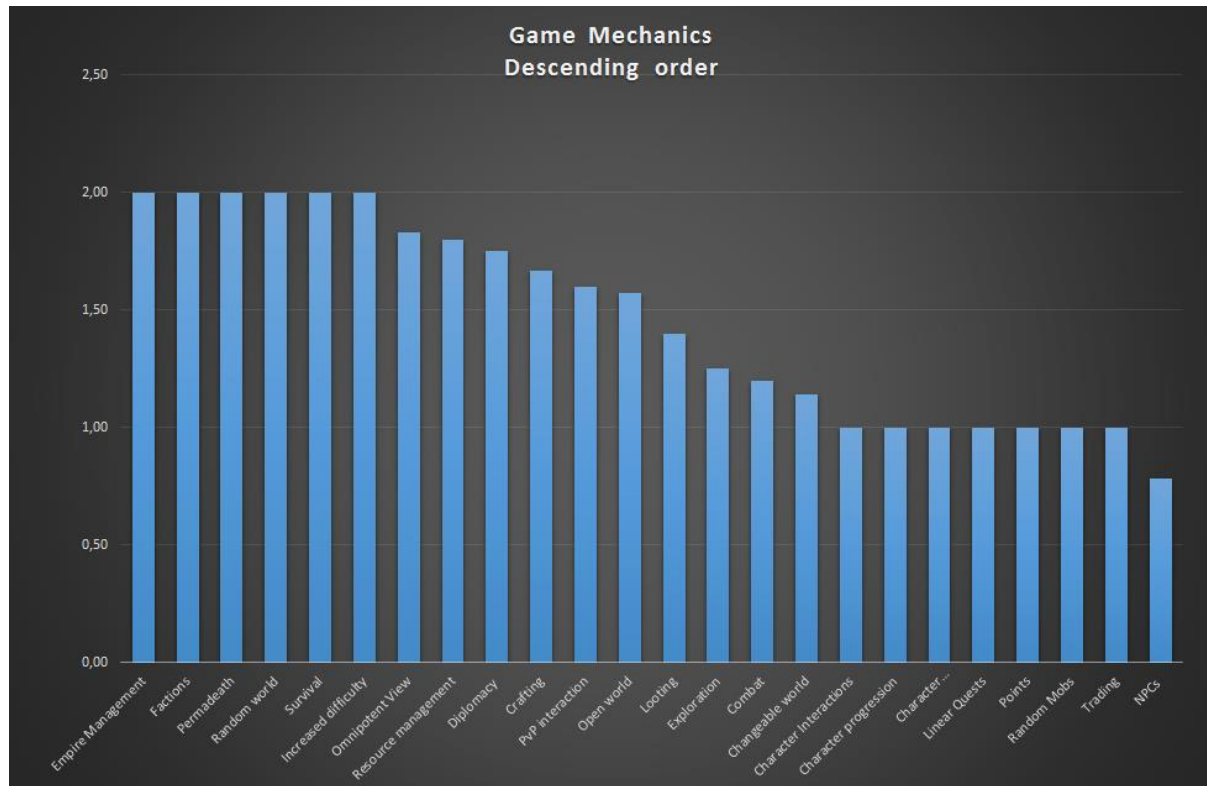


Figure 44. Graph showing rating of Game Mechanics

This table shows the means of the medians, alongside the number of games the game mechanic appears in.

6.9 Results – Main Game Mechanic Scale

Game Mechanic	Mean	SD	In # games
Empire Management	2,00	0,00	5
Factions	2,00	0,00	2
Permadeath	2,00	0,00	2
Random world	2,00	0,00	2
Survival	2,00	N/A	1
Increased difficulty	2,00	N/A	1
Omnipotent View	1,83	0,41	2
Resource management	1,80	0,45	5
Diplomacy	1,75	0,50	4
Crafting	1,67	0,58	3
PvP interaction	1,60	0,55	5
Open world	1,57	0,79	7
Looting	1,40	0,55	7
Exploration	1,25	0,71	8
Combat	1,20	0,56	15
Changeable world	1,14	0,69	7
Character Interactions	1,00	0,00	4
Character progression	1,00	0,53	8
Character states/moods	1,00	0,00	3
Linear Quests	1,00	0,00	5
Points	1,00	N/A	1
Random Mobs	1,00	0,00	2
Trading	1,00	0,00	2
NPCs	0,79	0,57	6
Random Quests	0,67	0,58	3

Table 14. Game Mechanic means and standard deviation

Results

Here we show two filtered version of the same table as above. They are both limited to the top 10 and the first one is with game mechanics appearing in two or more games and the second one is with game mechanics appearing in five or more games. Please see the main table for the standard deviations.

Means - In two or more games (Top 10)			Means - In five or more games (Top 10)		
GM	Mean	Count	GM	Mean	Count
Empire Management	2,00	5	Empire Management	2,00	5
Factions	2,00	2	Resource management	1,80	5
Permadeath	2,00	2	PvP interaction	1,60	5
Random world	2,00	2	Open world	1,57	7
Survival	2,00	2	Looting	1,40	7
Omnipotent View	1,83	2	Exploration	1,25	8
Resource management	1,80	5	Combat	1,20	15
Diplomacy	1,75	4	Changeable world	1,14	7
Crafting	1,67	3	Character progression	1,00	8
PvP interaction	1,60	5	Linear Quests	1,00	5

Table 15. Game Mechanic means of GMs in two or more games

Table 16. Game Mechanic means of GMs in five or more games

6.10 Game Mechanics - Individual Games

Below we show graphs of the medians of each game mechanic in the game, for a selection of games.

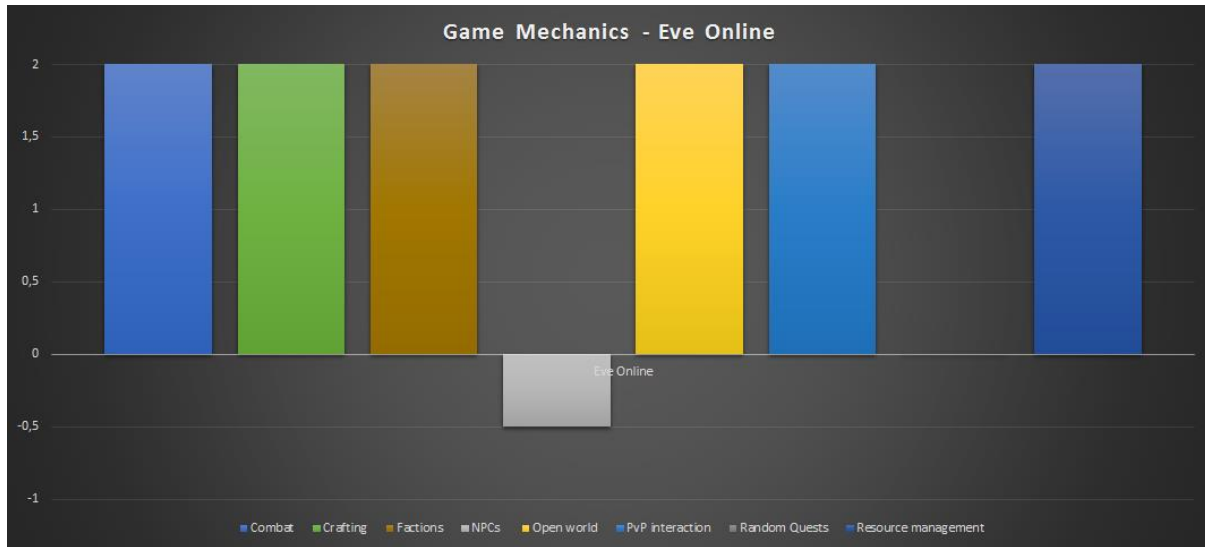


Figure 45. Game Mechanic means of Eve Online

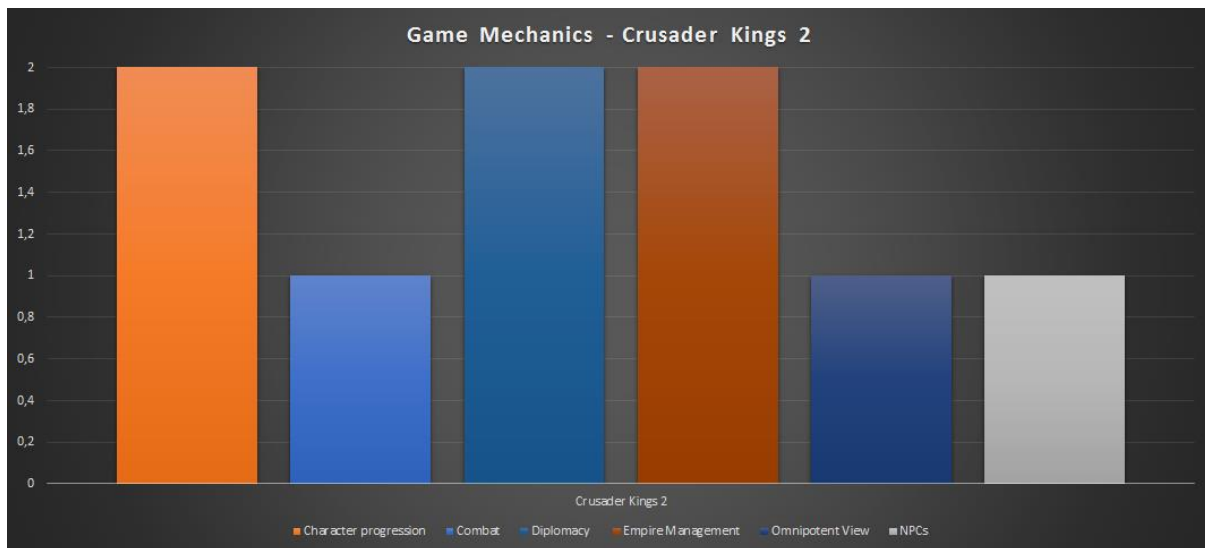


Figure 46. Game Mechanic means of Crusader Kings 2

Results

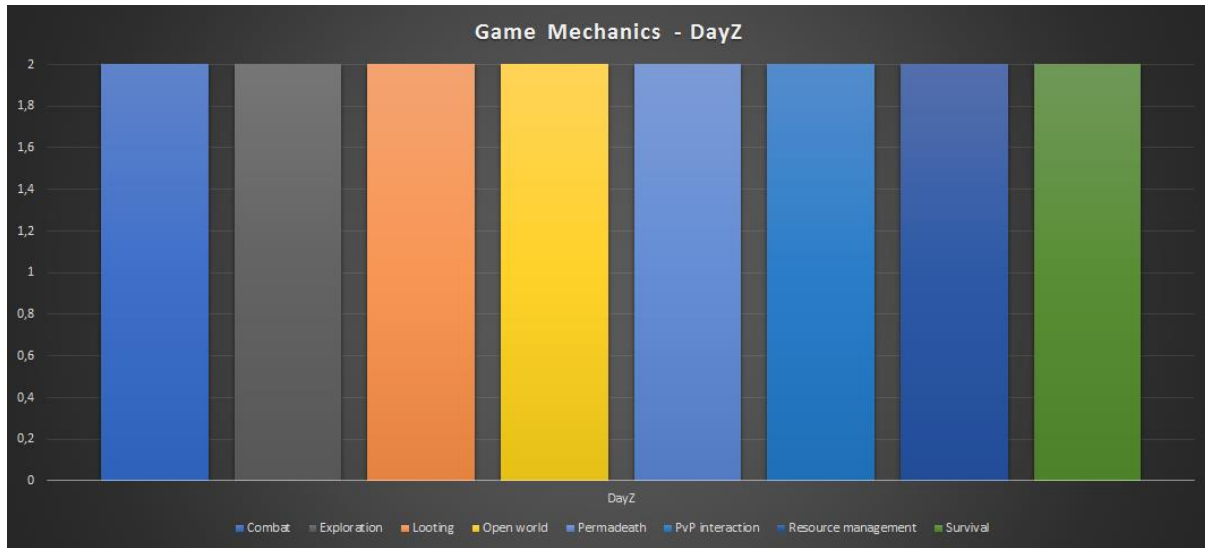


Figure 47. Game Mechanic means of DayZ

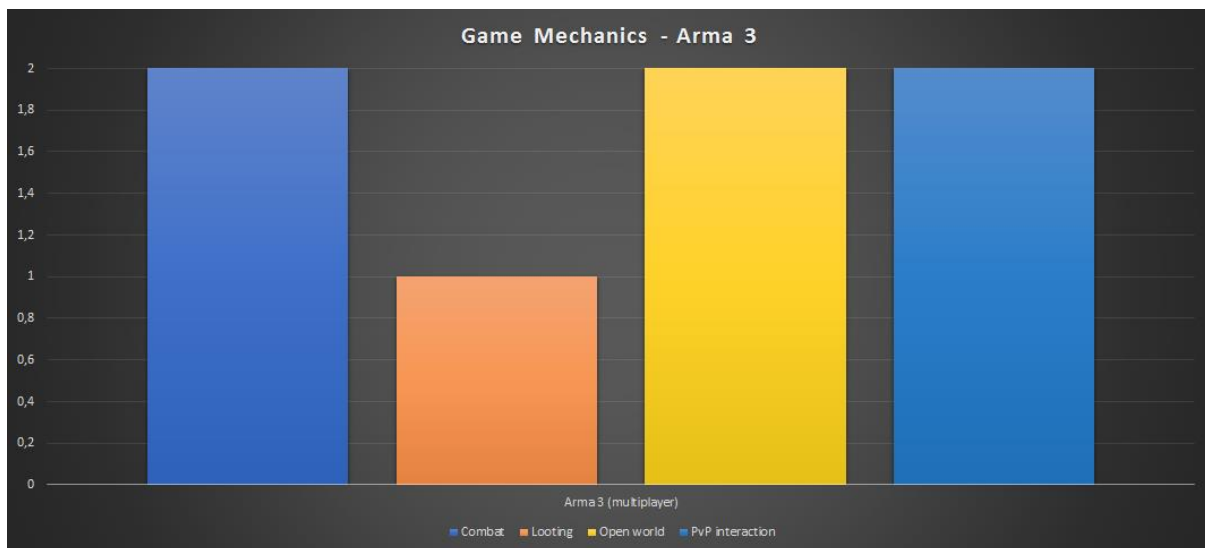


Figure 48. Game Mechanic means of Arma 3

Results

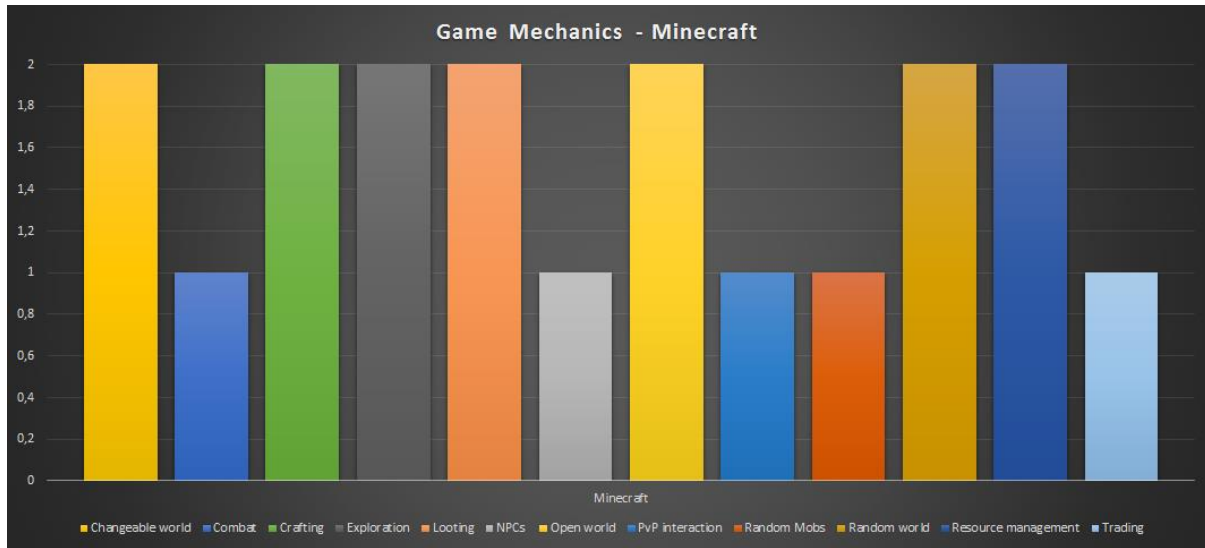


Figure 49. Game Mechanic means of Minecraft

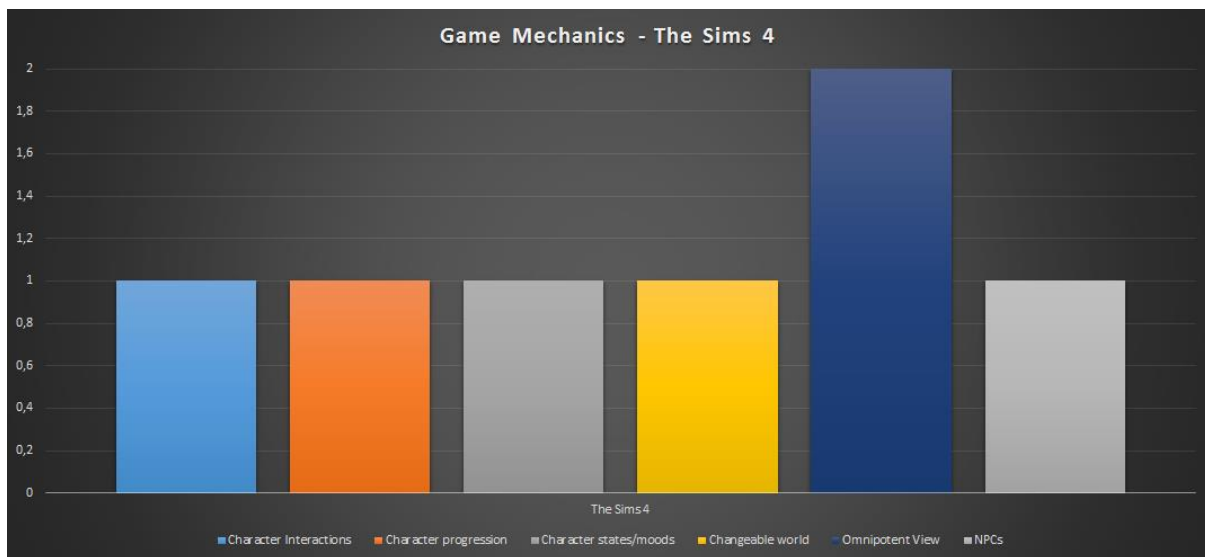


Figure 50. Game Mechanic means of The Sims 4

Results

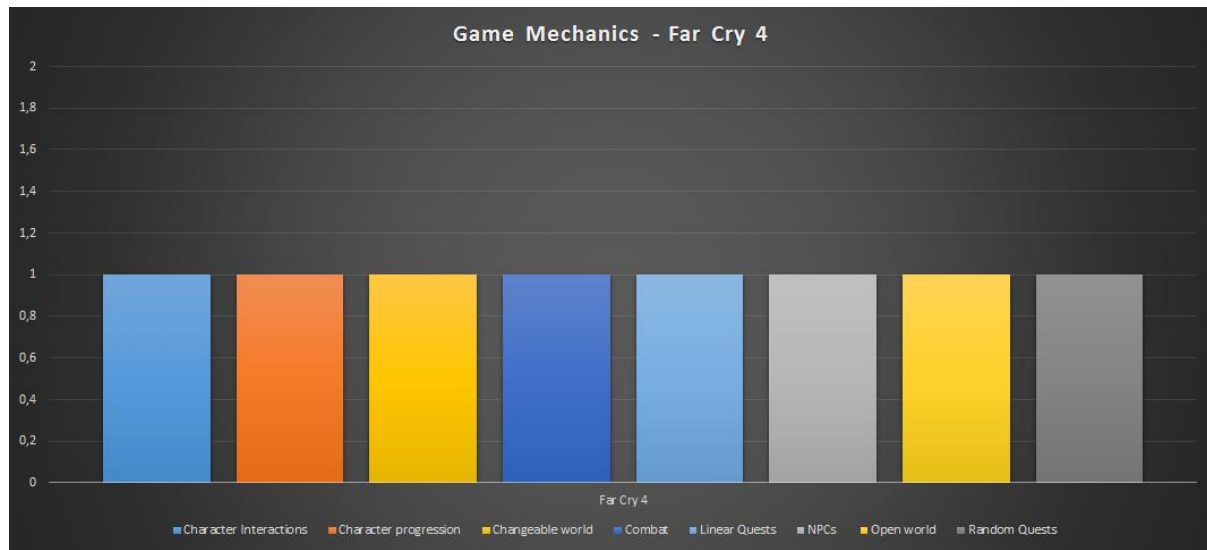


Figure 51. Game Mechanic means of Far Cry 4

6.11 Demographics

The demographics of the final sample can be seen in the following graph.

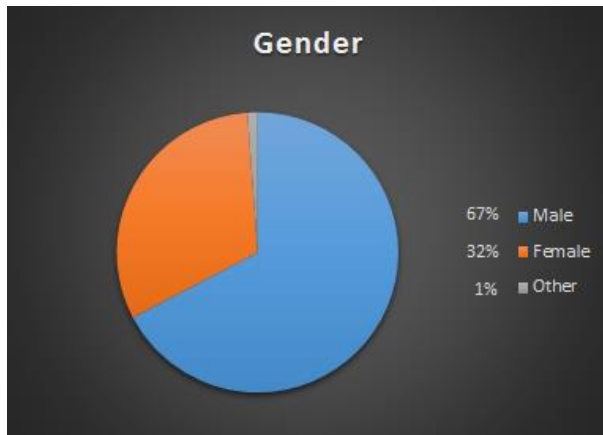


Figure 52. Gender distribution of final sample

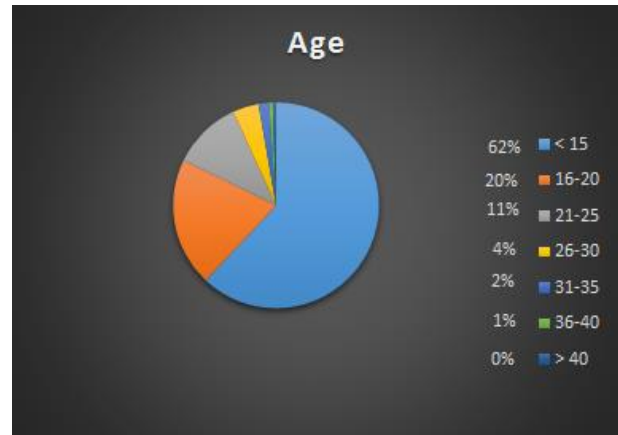


Figure 53. Age distribution of final sample

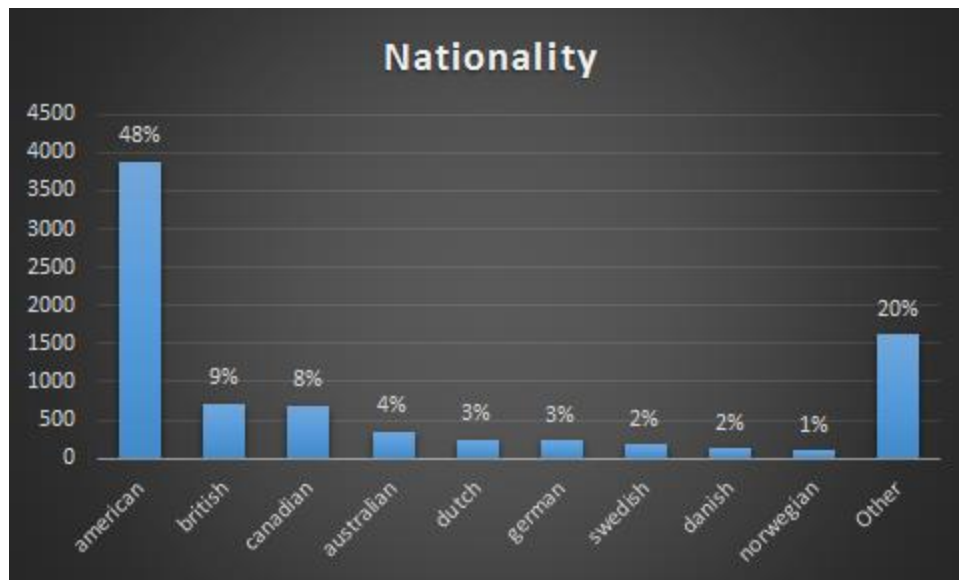


Figure 54. Nationality distribution of final sample

These distributions were very much as expected, although the age distribution is perhaps too heavily represented in the below 15 category, due to the fact that this question started out with this option selected.

6.12 Results - Correlations

Measuring the correlations between the means of the EN, the NT, the PI and the Self EN from above gives us the following correlations.

EN and Self EN: $R(14)=0.947, p < 0.05$
EN and NT: $R(14)=0.458, p < 0.05$
EN and PI: $R(14)=0.630, p < 0.05$

Table 17. Correlations. **First:** EN and Self-reported EN **Second:** EN and NT. **Third:** EN and PI

As they show, there is a very strong correlation (0.947) between the *emergent narrative* measured by our questionnaire and the self-reported *emergent narrative* from the *game mechanics* questionnaire. There is a moderate correlation (0.458) between the *emergent narrative* measured by our questionnaire and the *narrative transportation* measured by the *Narrative Transport Questionnaire*. And that there is a strong correlation (0.630) between the measured *Player Immersion*.

Now to see if they actually mean anything significant we have to look up the critical values for the Pearson's R correlation and we used the table from this source (Faculty.fortlewis.edu, 2015). We have an N value of 16 (the number of games in the correlation population) and looking up the critical values gives us, for an alpha value of 0.05 for a two-tailed probability, a correlation value of 0.497. This means that the correlation between *emergent narrative* measured by our questionnaire and the *narrative transportation* measured by the *Narrative Transport Questionnaire* is not significant, but the others are.

To double check this, we drew a scatterplot of the data and they can be seen after this section. They show that the EN and Self EN correlation has no outliers and the significance test is backed up. The EN/NT and the EN/PI correlations each have a single obvious outlier. This means that we cannot trust the results of the significance test and must perform a Spearman's Rho test on the data to test for significance. We did this for the EN/NT and the EN/PI correlations and got the rho values $R(14) = 0.559, P = 0.024 < 0.05$ and $R(14) = 0.521, P = 0.039 < 0.05$ respectively. Looking these values up in the Critical values of the Spearman's Rank test (Spearman's Rank Critical values, 2015), using $N=16$ and an alpha value of 0.05, we get a critical value for R of 0.503 and we can see that they pass this significance test.

So we can say with a fair certainty that these three correlations are significant, the implications of which will be discussed in the Discussion

Results

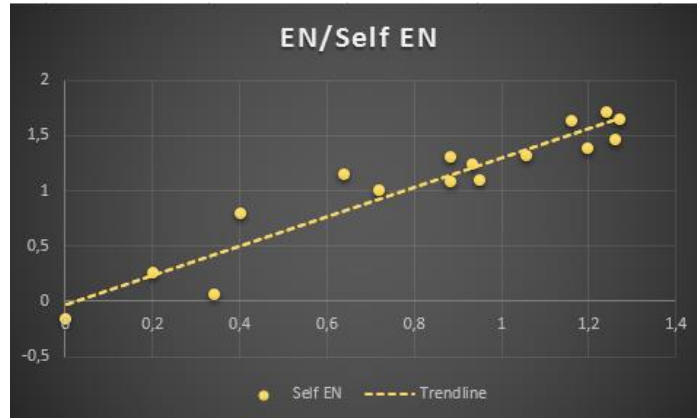


Figure 55. Scatterplot of EN/Self EN correlation

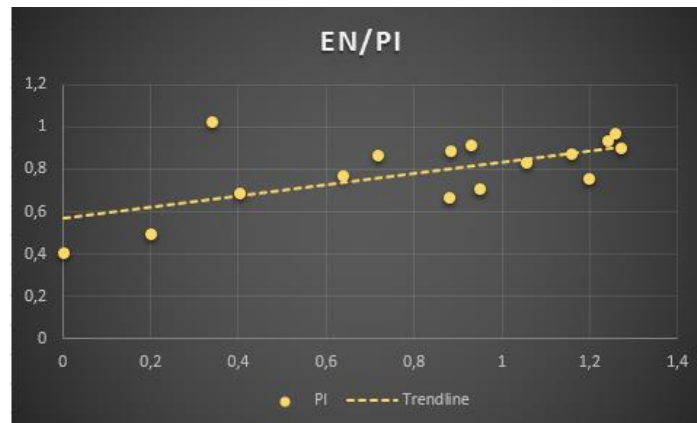


Figure 56. Scatterplot of EN/NT correlation

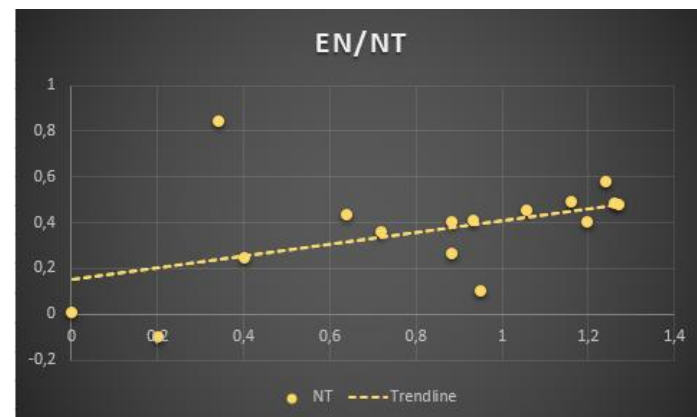


Figure 57. Scatterplot of EN/PI correlation

6.13 Null Hypotheses

To answer our null hypotheses we use the Mann-Whitney U test. Each of the null hypotheses will be dealt in turn.

Primary null hypotheses:

1. *There is no significant difference between the emergent narrative experience measured with the designed questionnaire, across the nineteen chosen games.*

To answer this question we run a Mann-Whitney U test on the EN scale, of the entire population of two games, comparing the highest ranked game to a range of games, starting with the second highest ranked game and then continuing down the ranking, if we get a result of no significant difference.

We encountered a significant difference when comparing the highest ranked game, Crusader Kings 2 and the fifth highest ranked game, DayZ. This is the result of that Mann-Whitney test:

Median_{CK2} = 1.33, Median_{DayZ} = 1.25 | Mann-Whitney U = 120056 | N_{CK2} = 1481 N_{DayZ} = 181 |
 P < 0.05 two-tailed | P = 0.02

Meaning that we can reject the null hypothesis.

The second null hypothesis of the primary research question was answer with a Mann-Whitney U test on the EN ranking and the Self EN score of the games giving us:

2. *There is no significant difference between the emergent narrative experience measured, and the self-reported emergent narrative.*

Median_{EN} = 0.91, Median_{Self EN} = 1.19 | Mann-Whitney U = 79 | N_{EN} = 16 N_{Self EN} = 16 |
 P < 0.05 two-tailed | P = 0.06

Meaning that we cannot reject the null hypothesis.

Results

Secondary hypotheses:

To answer the null hypotheses of the secondary research question, we ran a Mann-Whitney U test on the EN scale and the NT scale, and the EN scale and the PI scale respectively. Giving us the results below.

1. There is no significant difference between the emergent narrative experience measured, when comparing it to the narrative transportation.

Median _{EN} = 0.91, Median _{NT} = 0.40 Mann-Whitney U = 49 N _{EN} = 16 N _{NT} = 16 P < 0.05 two-tailed <u>P = 0.003</u>
--

Meaning that we can reject the null hypothesis.

2. There is no significant difference between the emergent narratives experiences measured, when comparing it to player immersion.

Median _{EN} = 0.91, Median _{PI} = 0.84 Mann-Whitney U = 102 N _{EN} = 16 N _{PI} = 16 P < 0.05 two-tailed <u>P = 0.32</u>
--

Meaning that we cannot reject the null hypothesis.

7 Discussion

Based on our process, so far in this paper and the results analyzed from the online survey, in this section we will sum up and reflect on our findings. First by answering the research questions asked in the analysis chapter, and then by reflecting on the process and any potential biases or mistakes we can see in our results. Added to this, we will also identify areas where more work could and should be done in the future.

7.1 Research Questions

First of all we will go through each of our research questions and answer them numerically, and then analyze what these results might imply.

Primary Research Question:

How can we create a questionnaire that can measure the Emergent Narrative, experienced by players, based on our definition of it?

And the first of the associated null hypotheses:

There is no significant difference between the emergent narrative experience measured with the designed questionnaire, across the nineteen chosen games.

When comparing the individual games and their emergent narrative scores, there can be seen a significant difference ($P = 0.02 < 0.05$) between the highest rated and the fifth rated game on the EN scale; Crusader Kings 2 and DayZ (and all the games below DayZ), disproving the first null hypothesis.

We can therefore assume that the questionnaire created does work as an analysis tool which distinguishes between player experiences in individual games.

This leads us to our second null hypothesis.

There is no significant difference between the emergent narrative experience measured, and the self-reported emergent narrative.

This statement we can regard as true. As can be seen in the results section, there is no significant difference ($P = 0.06 < 0.05$) between the measured emergent narrative experience and the self-reported experience.

Discussion

Furthermore the correlation between the highest rated EN games, when comparing them to the self-reported emergent experience is $R(14) = 0.947$, $p < 0.05$, showing a very strong correlation.

From this we can conclude that what we tried to measure in the EN questionnaire, and the self-reported emergent narrative question of the GM questionnaire (based on our explanation of it) in the survey are close to the same. We can therefore say that the EN measures the almost same amount of emergent narrative as the self-reported answers for the following experience:

An emergent narrative experience is something that happens to you as the player, as you progress and interact with the game world. Under some circumstances the player might start experiencing events or “stories” that don’t tie directly into the storyline of the game, but rather are events that you feel are unique stories happening to you just because you chose to act in a certain way (and might not happen again).

Considering that we perceive this to be the essence of what an emergent narrative experience offers to a player, we will say that we succeeded in our first research question, or put another way: we succeeded in creating a questionnaire that will measure the emergent narrative experience a player has in an individual game. Further considerations are still needed which will be addressed here.

A second strong indication of the questionnaire’s merit is our choice of games in the analysis section. There we looked for examples of communities, where players showed a strong urge to tell stories in the form of descriptive narrative. The games showing the strongest of those communities were: Crusader Kings 2, Dayz, Europa Universalis 4, EVE online, Civilization 5, Rimworld and Rome total war 2. Five of these six games, make up the highest rated emergent narrative experiences. Furthermore the games perceived as having a strong emergent narrative potential line up most of the

Strong descriptive narrative	EN ranking
Civilization 5	Eve Online
RimWorld	Crusader Kings 2
Total war: Rome II	DayZ
Europa Universalis 4	Europa Universalis 4
Crusader Kings 2	RimWorld
Eve Online	Total war: Rome II
DayZ	Mount & Blade Warband
Emergent narrative potential	Civilization 5
Mount & Blade Warband	Arma 3
The Sims 4	Minecraft
Skyrim	The Sims 4
Minecraft	Skyrim
Far Cry 4	Far Cry 4
Comparative	Spelunky
Arma 3	Bioshock infinite
Spelunky	Battlefield 4
Bioshock infinite	
Battlefield 4	

Table 18. On the left: the EN ranking
on the right: division of games based on their EN potential

middle half of the scale with the exception of Far Cry 4 being rated lower than expected. The comparative or baseline games then line up the bottom part of the scale.

Secondary Research Question

Our secondary research questions will be addressed next. These were:

1. Is there a relationship between the Emergent Narrative experience a given player has and the Narrative Transport?
2. Is there a relationship between the Emergent Narrative experience a given player has and the narrative player immersion?

With their accompanying null hypotheses:

1. There is no significant difference between the emergent narrative experience measured, when comparing it to the narrative transportation
2. There is no significant difference between the emergent narrative experience measured, when comparing it to player immersion

The first null hypothesis can be answered as false, as there is a significant difference ($P = 0.003 < 0.05$) between the EN experience measured when comparing it to the narrative transport.

The second null hypothesis, cannot be rejected because there is no significant difference ($P = 0.32 < 0.05$) between the EN measurement and the PI measured.

Based on these findings we can say that there is a significant difference between what the narrative transport, and the emergent narrative are measuring. This is not a surprising result in itself, since it is our belief that stronger, more conventional narratives will create a stronger narrative experience in the more conventional, linear sense of the word. The game that showed the strongest narrative transport was Bioshock Infinite; the most linear, story centric game out of the whole selection. The Narrative transport questionnaire is also designed for linear narratives, books and literature to be exact, where we changed only the references of books, to games and readers to players. So it is our assumption that the fact that they show no connection only serves to strengthen the argument for new narrative theories being needed to measure emergent narrative and interactive media experiences. On the other hand their spearman's correlation is significant ($R(14) = 0.559$, $P = 0.024 < 0.05$), which indicates a strong correlation between the narrative transport and the emergent narrative experience. This could indicate that some form of narrative closure is

perceived in the instances of emergent narrative, which would line up with the theory of emergent narrative and a feeling of narrative closure being connected.

Immersion on the other hand shows a connection, because there is no significant difference in what the two questionnaires measured, and a spearman's correlation value of $(R(14) = 0.521, P = 0.039 < 0.05)$ which indicates a strong correlation, although it barely passes. As Calleja mentioned, immersion should be important for the experience of emergent narrative, this seems to back up the assumption that emergent games are somewhat immersive. Still the correlation is not all that strong, meaning that all we can conclude is that games that allow for an emergent narrative experience, are somewhat immersive as well. A more refined selection of games might have shown different results. The problem with this is that games can be highly immersive without emergent narrative, and testing the definite connection between them would require different considerations.

Additional Research Question:

- Can we create a questionnaire to measure how game specific mechanics help the player experience Emergent Narrative?
 - a. Which game mechanics are most helpful to the process, if players experience Emergent Narrative?

Considering that the game mechanic questionnaire was the only questionnaire that could not be transformed into a Likert scale and therefore is not immediately comparable to the other data, we cannot answer anything definite about it, but we will discuss and hypothesis on it based on our results in the following chapter.

7.2 Further Discussion and Future Works

In this chapter we will discuss further on our process and the implications of our results, along with worthy considerations and mistakes recognized in the process.

The findings of the emergent narrative questionnaire

When concluding on the success of our emergent narrative questionnaire there are a few things that can be discussed. The numbers show a clear indication that our questionnaire, measured the strongest emergent narrative in the games that have already shown themselves to have strong, story sharing communities. When talking about genres or families of games, those that ranked highest on the list can be classified as either

narratives of miniatures, using Callejas definition, or online multiplayer games. This strongly backs up the quote from Calleja, when he talks about the resemblance of improvisational theater and multiplayer games.

On another note it is worth considering the placement of The Sims 4 and Civilization 5 in the ranking. Both of them rate around average. This shows that they do offer emergent narrative but not the same amount as some of the others. This is interesting, considering that both these games are some of the more mentioned games in the narrative research community when emergent narrative is being discussed. The main difference between them and the higher rated games is that both offer emergent narrative on a more abstract level, which might indicate that abstract design, although offering some emergence, will not necessarily give as a strong an emergent experience as the multiplayer emergence or the more systematic emergence offered by the narrative of miniature games. Civilization 5 and Crusader Kings 2 are for example, similar in many aspects, both are grand strategy games and offer narrative of miniatures, but Crusader Kings 2 has a stronger narrative element in the inclusion of story snippets which explain and influence the system and the characters in the game, which could, possibly, lead to a higher sense of closure for the player.

Self-reported Emergent Narrative

What we can say about the self-reported emergent narrative is that it measures the definition that we gave to the test subjects, quite well. The debate then, on whether or not our explanation encapsulates emergent narrative well enough, is a whole other discussion. It is our belief that this explanatory text encapsulates the emergent narrative experience well enough, and in a format understandable in layman's terms.

Is the Emergent Narrative questionnaire measuring what we want?

One very important consideration to make is, whether or not our Emergent Narrative questionnaire actually measures what can be considered emergent narrative and if the questionnaire itself is structurally valid. To validate the questionnaire, mathematically, exploratory factor analysis could be done as a first step to test the interrelation between the variable in the questionnaire. This might show us that some of the questions do not have a big influence on the outcome of the test and are therefore excludable in future use.

Additionally it would be a good idea to use the questionnaire in further tests, measuring on other (types of) games, to see if the questionnaire continues to predict the level of emergent narrative.

Games we know were designed with emergent narrative in mind

Another interesting consideration leads back to our discussion on replayability in the background section. According to our results, Far Cry 4 does not offer a strong emergent narrative; still, according to the interview we quoted in the background chapter, emergence was one of the design considerations for the game.

Discussion

We could argue that the anecdotal moments or emergent gameplay moments that could be the stronger parts of the system in Far Cry 4, do not appear to be strong enough for the user to experience emergent narrative, but that's only hypothetical.

Looking only at the numbers, we could conclude that the designers of Crusader Kings 2, who set out to create an emergent narrative, succeeded. At the same time we could say that the development of Far Cry 4, which set out to create a more personalized emergent narrative failed. This could be caused by the intended market for each of those games, Crusader Kings 2 is what could be considered a niche game, created for a specific part of the market. The problem with niche games is that it will not fit with everybody's interest. This can be clearly seen when looking at player statistics (as of 30th of June 2015 the average play time is 87.2h per player with a median of 9.9h (SteamDatabase, 2015)). While Far Cry 4 is one of those games where the perception is that they tried to appeal to all gamers alike (the average playtime per player is 34.2h with a median value of 24.0h). This can also be seen in the number of sales. Crusader Kings 2 sold 1 million copies, and 7 million DLC units (Hall, 2014), while Far Cry 4 had by the end of 2014 sold 7 million copies of the main game. (Ubisoft, 2015).

But that is if we go into it with the assumption that our questionnaire was able to catch all instances of emergent narrative. In hindsight and after analyzing the data, we see an important discrepancy. We know for a fact that Crusader Kings 2 offers a great amount of replay ability for those that the game appeals to. With the more dedicated players sinking hundreds of hours into the game. But what about Far Cry 4, if the emergent narrative system in Far Cry 4 is well crafted, and players are allowed to make choices and change their minds, thus crafting their own personal story. If they then, never go back and create another character or start up a new game, they might not even notice the forming of their personalized stories. In our demographics part of the survey, we asked our test subjects how many hours they had put into the game, we gave them the chance to answer somewhere between 0 to 50+ hours. The reason we are not concluding anything of value from that data, is that we think it was a missed opportunity. A more important question, could have accounted for replay ability. By asking how many times they have started a new game, or how many times they have created a new character could have given an indication of the replay value of that title. That combined with the emergent narrative score would then have shown more definitely which games are offering strong emergent narrative experiences with replay ability.

Another fact about that question is that we cut it off at 50+ hours. As mentioned in the discussion about Population biasing, people who go out of their way to subscribe to a specific subreddit where only a single game is discussed, are very likely to have put some hours into the game, making the question quite irrelevant. On top of that, we received number of the personal messages and online comments to the survey,

criticizing that question as giving way to low values. We received many comments like this one, which was posted as an answer to the Skyrim survey:

“Done. Nice survey, too. But, as others pointed out, 50+ hours is for infants. It barely scratches the surface of the game world. ;-)” (Joker961, 2015)

Our original idea with this question was our assumption that in order to start experiencing emergent narrative, a player would need to have played a certain amount of hours (dependent on the game) in order to fully understand the game mechanics and therefore, becoming fluent enough in the “language” of the game to start experiencing his own emergent narrative, but we could have used this question to much greater effect.

Game mechanics

Looking at the game mechanics could give us an indication of which systems are the strongest in the creation of emergent narrative. Please see the main game mechanic table in the Results, for the standard deviations. (Table 14)

Means - In two or more games (Top 10)		
GM	Mean	Count
Empire Management	2,00	5
Factions	2,00	2
Permadeath	2,00	2
Random world	2,00	2
Survival	2,00	2
Omnipotent View	1,83	2
Resource management	1,80	5
Diplomacy	1,75	4
Crafting	1,67	3
PvP interaction	1,60	5

Means - In five or more games (Top 10)		
GM	Mean	Count
Empire Management	2,00	5
Resource management	1,80	5
PvP interaction	1,60	5
Open world	1,57	7
Looting	1,40	7
Exploration	1,25	8
Combat	1,20	15
Changeable world	1,14	7
Character progression	1,00	8
Linear Quests	1,00	5

Table 19. Game Mechanic means of GMs in *two* or more games Table 20. Game Mechanic means of GMs in *five* or more games

However this is debatable on many levels: We chose the game mechanics and we defined their description. We might not have included all game mechanics for a specific game. Or a particular game mechanic could have been omitted, because it is not present in the game we chose.

Discussion

What we can say though is that the highest rated game mechanics seem to match with those seen in the highest rated EN games. This indicates that those games are designing the systems of game mechanics in a way to facilitate emergent narrative. So investigating exactly what these interconnections are would be an interesting next step.

This does not leave much to create or even hypothesize about a possible design framework to further the development of games with high emergent narrative. For example, taking the top 5 from each of the two table above gives us a list of likely game mechanics that can increase emergent narrative, if implemented properly. However as no analysis on the implementations of the game mechanics and their in-game relationship has been performed, it is not really possible to conclude anything from it at this time. But further analysis into the design of these specific systems, and the design methods used in its creation could lead to further interesting results.

Game profiles

As shown in the Results chapter, the game profiles we put together (showing the NT and PI means) do not show any clear indications of which games rate high in the EN questionnaire or the Self-reported EN.

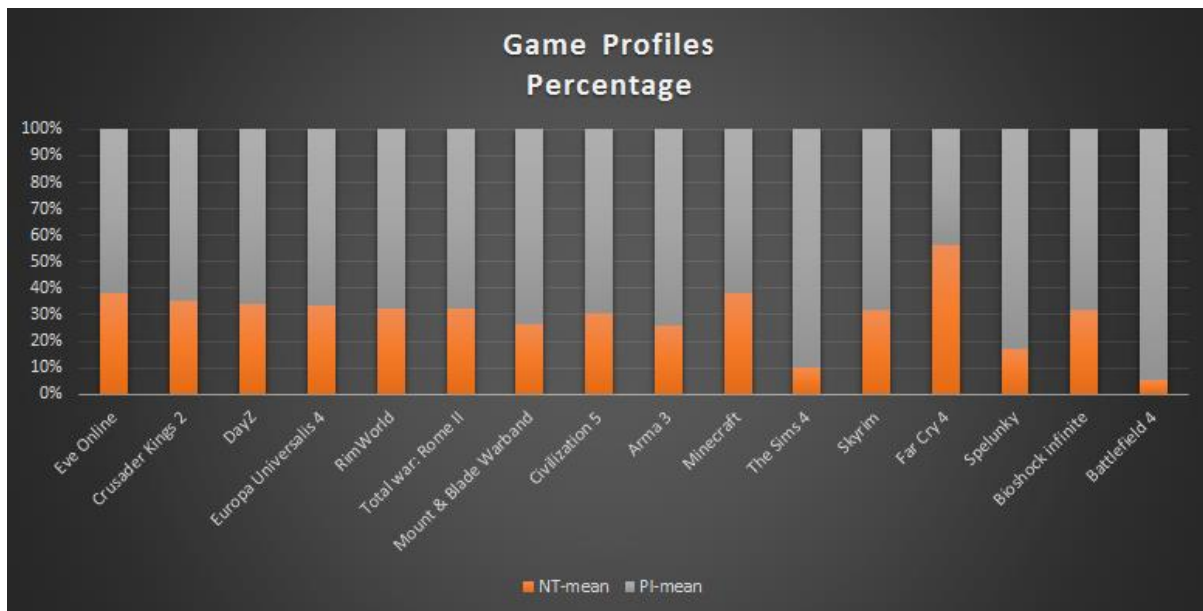


Figure 58. Graph showing percentage view of Game Profiles, ranked according to Self EN, highest being on the left. EN component is not shown.

This graph, also shown in the Results, depicts the games, in ranked order (highest Self EN to the left and descending, and only showing the NT and PI components) and there is no clear indication as why a game should be on either end of the scale. Neither does the PI dimension breakdown reveal any clear

Discussion

relationships. This just goes to show that, while the correlations between the values do show a relationship, it is not immediately obvious in the data and indicates that there are other factors in play.

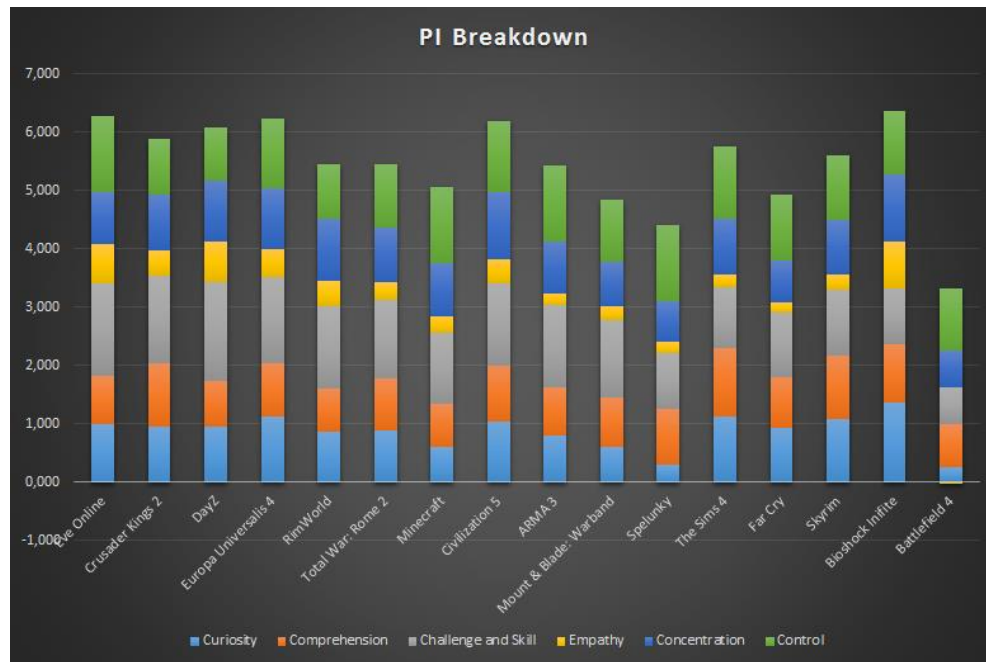


Figure 59. Graph showing PI dimension breakdown, ranked according to Self EN, highest being on the left

Choice of games

We could have included a wider range of games: Exploration games, games that focus on environmental storytelling, more abstract games and many others. This would give a broader picture of the narrative experience players have in different game environments and might reveal more interesting patterns or correlations.

A few of the games that were tested are interesting to discuss further.

The games of the Sims franchise is in many ways an abstract simulation of human life, and is widely referenced in the research community. So why does it get a middling score on the EN questionnaire? It could be exactly because it is an abstract simulation of human life. There are not any goals built into the system of the game, it is just a simulation of life. There are no system actively working against you, trying to make you fail the game and this completely open and “unopposed” gameplay might not be giving the players the closure they need to experience emergent narrative.

Minecraft would have been expected to be higher on the EN score list but when you look at the games design, the emergence of narrative happens within the game during the creation process, not as a story for

the player. People show off their creations; they, mostly, do not talk about the stories they experienced in Minecraft, but rather about their experience of constructing some project, or its results. While there are some stories about the adventures of players playing Minecraft, they are mostly anecdotal in nature.

Mount and Blade:Warband is lacking in the character interaction. The game system offers a great amount of replay ability, since its system will never play out the same way, but it has a low degree of closure; people rarely finish a game of mount and blade but frequently start up new games using new player created modifications.

Skyrim and Far Cry 4 are the weird ones out. Both strong in free exploration, and player choices but also really strong in getting the player back on track by mixing it with linear narrative, but both score middling to low on the EN questionnaire. It would be interesting to take a closer look at these two games and investigate the exact nature of the narrative experience players are having in these games.

Game mechanic survey mistake

During the implementation of the GM questionnaire, we made a mistake in the ordering of the game mechanics for Skyrim. The mistake was that Skyrim was assigned its list of game mechanics, shifted by one (e.g. if Skyrim had the game mechanics: 2, 3, 6, 8 and 9, then it was assigned 1, 2, 5, 7 and 8). This happened due to input mistake when ordering the mechanics list. The mistake was not caught in the testing we did ourselves nor in the pilot test. What this means for our data is that we can only use the data of the game mechanics that were correctly assigned, such as 2 and 8 in the above example and game mechanics that might possibly be fitted to the gameplay in Skyrim, even though they were not originally assigned. Another issue is that some of the mechanics that we accidentally included for Skyrim actually got high scores, which further indicates our game mechanic questionnaire to be flawed, especially for some of the more complex games.

Sample size

Another worthy consideration is the big sample range disparity between the different games. Where the biggest sample, for Skyrim gave us 4.736 answers on the EN scale while the lowest included game, Spelunky only had 101 answers. Of course this requires some considerations when looking at the data, but when they were compared using same sample sizes, the results did not fluctuate a great deal, which indicates to us that using the whole population samples separately but analyzing them comparatively will indicate appropriate results.

Non applicable answers

During the conduction of the pilot test, there was some confusion shown by the testers, where they asked us if they should put in a neutral or highly disagree answer, if they found that the question did not apply to their experience with the game. In order to cause the least amount of noise to the data, we made the decision to add a Non applicable option to the Likert questionnaire. We received quite a few of these non-applicable answers, for some games more than others. The way we worked with the data, was that in order to be used as in the Likert scale score, a questionnaire would at least four or more answers. But what can be concluded from this amount of N/A answers, and how does it affect our results? First of all, the games offered a wide range of different experiences, meaning that some of the questions may not have been applicable for all the games. Perhaps the questions were too general in nature, and perhaps we should have made more game specific questions, especially in regards to the game mechanic and emergent narrative questionnaires. This would have meant more data and thereby more work required on the analysis of these results. But as it stands with many projects that is something we did not possess the time to accomplish. However, this also gives us clearer data. We can now, both account for the validity of the results, and at the same time we can account for people's opinions on particular questions in regards to particular games. Something that would have been lost in data noise, if we had gone without. Another thing we could have done would have been to classify all N/A answers as strongly disagree, to compare against the data where we excluded them. This could have offered an interesting comparison.

Biases

We have identified some potential biasing in our data: Central tendency, social desirability and selection bias. Central tendency biasing could be happening in our questionnaire, because we are using likert type questions with five values. This is a recurring problem with questionnaire such as this: participants might not feel comfortable in answering in the extremes and this could cause some answers that belong in either strongly disagree or strongly agree to be placed in the: disagree or agree answers. Social biasing could also, very likely, be happening. Many games are already described as being emergent, immersive and other such buzzwords (buzzwords for the industry that is). This might potentially influence some of the answers if the participant guessed the purpose of the survey. The last biasing we have identified is the population bias; as we are recruiting participants from subreddits that concern themselves with one specific game, this means that the people on the subreddit have gone out of their way to subscribe to the subreddit and want to receive information regularly about it. This means that they very likely have a high opinion of the game and therefore could be more prone to giving high answers to questions that are positively worded and low answers to questions that are negatively worded.

7.3 Perspectives

Considering the amount of data gathered in the online survey, where 680.000 individual answers were given. We, as the authors of this paper, feel like we have only addressed the tip of the iceberg. With this immense amount of data to analyze, we could only try to answer our most fundamental questions in this paper. The data could be re-evaluated in a number of ways. First of all these 60 or so questions could be fitted into new and different theoretical frameworks, looking for other kinds of results or patterns. Additionally, as a keen observer might have noticed, we have not touched on the results of the player type questionnaire. For that questionnaire we received around 6000 responses which can then be linked to that person's answers in the rest of the survey. It is unlikely for all players to experience games the same way, or that they look for the same things when playing them. So a further analysis on the links between player types and their game experiences could possibly open the doors to a range of new findings.

This paper demonstrates only the first attempt at quantifying the emergent narrative experience. There is still a great deal of work that needs to be done. The questionnaire itself needs further analysis and validation, before it can be considered complete.

An interesting next step could be putting increased attention on the games that ranked the highest on the emergent narrative scale, and do qualitative analysis on how the systems within those games work and how they influence the player's experience of emergent narrative. It is our belief that impactful design frameworks and considerations could be developed out of this, which could, possibly, make their mark on the research community and the video game industry alike.

8 Conclusion

This paper has detailed the analysis of the concept of emergent narrative within the research community and the gaming industry. After detailing the ongoing discussion, we have added to it and defined emergent narrative as being:

Emergent narrative is created, internally by the player, as a non-scripted self-narrated player story that gives closure.

Or

“Emergent narrative is an intrinsic experience, which transpires as a mental process, through cognitive storification or alter biographing, as a player interacts with a

Conclusion

systematic virtual environment. As the player navigates and interacts with the game environment and ludic system, the story emerges through that interaction, either during the play session, or after-the- fact, once the player has had time to reflect on the experience events. The story that emerges is therefore a non-scripted, self-narrated player story that gives closure, which can appear through a collaborative process between the system and the player. This feeling of closure can either appear from within the system itself, or in the mind of the player, depending on the abstract or didascalic nature of the narrative. It is a narrative, that to the player feels unique, or one of a kind. The narrative in itself does not have to be one of the kind, but the system needs to be complex enough for the player to experience it as such. “

In the process of analyzing emergent narrative, seven video games were identified based on their strong emergent narrative. This assumption was based on their strong tendency to create descriptive narrative in their online communities. Six games were chosen based on their emergent narrative potential, based on their design or reported design considerations, and seven more were chosen based on their potential to be similar in nature (but different) from members of the strong emergent narrative group, or to as a baseline for the survey.

Furthermore an online survey was designed and conducted. The survey was made up of five distinct analysis methods, which looks at different aspects of the interactive narrative experience in video games. Two out of the five questionnaires were designed by the authors of this paper for the purposes of, first measuring the emergent narrative experience, and secondly to measure which individual game mechanics, the test subjects would report as having the strongest influence on their emergent narrative experience.

The online survey was presented to members of 20 different subReddits, which each concerns one of the twenty games chosen. The amount of data gathered was 13.547, 11.678, 10.146, 9.438 and 5.220 respectively for the Emergent narrative, Narrative transport, Player immersion, Game mechanic and the Bartle test questionnaires.

When analyzing the results, to answer the research questions put forth in this paper, there was no significant difference measured between the emergent narrative questionnaire and the self-reported emergent experience ($P = 0.06 < 0.05$) with a strong correlation of $R(14)=0.947$, $p < 0.05$. It is therefore assumed that the questionnaire created in this paper, worked relatively well in classifying emergent narrative based on the explanation given to the test subjects.

Conclusion

An emergent narrative experience is something that happens to you as the player, as you progress and interact with the game world. Under some circumstances the player might start experiencing events or “stories” that don’t tie directly into the storyline of the game, but rather are events that you feel are unique stories happening to you just because you chose to act in a certain way (and might not happen again).

The results also indicate that there is a medium and strong correlation between the emergent narrative questionnaire and narrative transport or player immersion, $R(14) = 0.559$, $P = 0.024 < 0.05$ and $R(14) = 0.521$, $P = 0.039 < 0.05$ respectively. Narrative transport and immersion can therefore be concluded as significantly influential in games where emergent narrative is likely to appear.

The amount of data gathered was big and covers a wide range of different aspects of the interactive narrative experience. Much further work is needed in order to analyze and look at this data, and we are sure there are still a number of interesting findings hiding within it.

9 Acknowledgements

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11 Appendices

Appendix A - Evidence of storification

DayZ

Stockholm Syndrome: How Six Men Kidnapped Me in DayZ by Adam Ruch

<http://games.on.net/2012/07/stockholm-syndrome-how-six-men-kidnapped-me-in-dayz/>

“A man chooses, a slave obeys.” What of the man who chooses to obey, and become a slave?

First things first: this is not real slavery – this is inside a videogame. I realise that I could always abort, or respawn. The point is that I chose not to. So come with me on this journey where we forget we are playing a videogame, forget the ESC key exists, and immerse ourselves in the virtual world that is *DayZ*’s apocalyptic Chernarus.

This is the story of how six heavily-armed survivors took me hostage, and turned me into a slave.

I found myself washed up on the beach near Kamenko. I had barely taken ten steps when I heard voices, and fractions of a second later, I realise they aren’t the usual disembodied gibberish that often clog the global chat channels. These are ‘real’ voices, coming from the half-dozen or so figures jogging out of the woods towards me. They are saying my name.

Six people, I thought for a brief moment, the most people I’d ever seen together in Chernarus! I also realise that they haven’t shot me dead yet – another miracle. I notice their military-grade rifles and begin to parse their jumbled greetings and finally come to focus on one word: slave.

Suddenly the world spins, an hourglass appears, and I’m on the ground. I’ve been shot and I’m dying.

Oh well, I think to myself, no surprise there. Chernarus had been a kill-on-sight deathtrap for quite some time. Fear is a virus here, spread by murder. Having contracted it, you spread the disease on farther, lest it kill you again. We become the most dangerous feature of this hostile environment.

Death is too easy

I do not die. My character stumbles to her feet as my assailants apply bandages to my wounds. I had lost 90% of my blood though, so the world was a flickering, black-and-white haze. They continue talking to me, with more clarity. One voice in particular belongs to a leader of sorts, called Gare, and he explains my situation to me.

Appendices

“You are now our slave. If you follow instructions, you’ll stay alive. If not, we will shoot you.”

The six high-powered rifles aimed at me, and the haziness of my vision lent the last part a great deal of credibility. But the first part? What would I make of that? I admit, my hand hovered over the Esc key as I replied, “A slave am I? What exactly do I have to gain?” or something to that effect. I became remarkably pithy in the face of my own protracted death.

“We work on a points system. If you do well in your missions, we’ll keep you around and eventually give you a gun and you can join the squad,” replied Gare.

This is what I’ve been waiting for, I thought to myself. I can’t just abort now. This is the most humanity I’ve seen in my many (many) hours hiking alone through the wilderness. I can’t disappear into the aether simply because it is ugly.

I agree, and they transfuse some blood to me. I follow.

Our first target, they tell me, is Balota airfield. I surmise they want the military munitions there. We jog cross-country. During the journey we lose the “wookiee” – their Ghillie-suited friend, so my captors are down to five. I still have no weapon, however, and my running speed is no match for their scoped rifles.

They make me pose in front of them, kneeling, for a photo.



We arrive at Balota, and I am given the task of reconnaissance. I am no stranger to creeping into compounds, so it seems a straightforward task. “Run in, scout the tower and both hangars. If you see any people just run, and we’ll cover you.”

Appendices

I agree, though suggest I might creep in to avoid zombies. This seems to amuse my captors, who claim that they will cover me. I decide to creep in anyway.

The tower was empty: no players, no loot.

As I approach the first hangar, however, two zombies are patrolling past, so I drop back a distance and wait. Creeping forward again, I turn the corner and a zombie looks right at me. I sprint away, back towards my captors. Would they assist, or simply watch me run, helpless?

Suppressed automatic rifle fire answers my question. The zombie drops dead and I rejoin the group, fearing their reactions to my failure to scout the hangars. They surprise me. My tactical approach pleased them, and I was awarded two points, instead of one.

They give me a can of food and drink.

I run, flanked on all sides by these heavily-armoured soldiers who threatened to kill me if I “tried anything stupid,” and feeling the safest I have ever felt in Chernarus

Just as we are about to leave, one of them sights a player in the distance, near the airfield. “See what happens to those who don’t comply?” asks Gare. Rifle fire. Joshua is killed. Gare is remarkably polite, having not once used anything like vulgar language. Apart from “slave,” I guess.

We head to Chernogorsk next. I surmise correctly that they will want to hit the hospital for medical supplies. This is a longer run, as we loop north to come in at the best angle. I run, flanked on all sides by these heavily-armoured soldiers who threatened to kill me if I “tried anything stupid,” and feeling the safest I have ever felt in Chernarus.

We arrived north of the hospital and apartment complexes on the edge of Chernob. I was familiar with this area, having raided both locations several times myself—but these commandos didn’t need to know that. They send me in, crossing the terrible open ground between the trees and hospital, once again assuring me of their protection. I was to retrieve morphine, epi-pens, “the works” one said. Fine, I thought, just fine. I can do that.

I got close and realised with some dismay that the glass that shielded the hospital was still intact. Breaking it would bring countless zombies down on me, and I’m not even sure I can break it without a weapon. I circle behind the hospital and find a box of mediocre medical supplies. *Better than nothing*, I think.

As I come around the far side of the hospital, crawling prone, I hear shots, very close. Rifle shots, a Lee Enfield or CZ550 maybe. Not the automatic assault rifles carried by my captors. I scurry across the concrete between hospital and apartment, and hole up inside. More shots. I think it’s coming from the next apartment block.

Appendices

Rambler was killed.

Nobody is safe

Rambler—was that one of my captors? I think so, but can't be sure. I stay hidden in the apartment, searching desperately for a means to defend myself to no avail. If only I could hurl ammunition or Pepsi cans...

Finally all is quiet. I wait some time more, but genuinely want to get back to the protective thrall of my five captor commandos. I sprint across the open field, hoping to find them waiting for me. I get back to the little copse of trees, wondering if it was the right one.

Bang, bang. Rifle shot. Loud. The first one doesn't get me, but the second does. I hit the ground and don't get up.

In the end, the same thing killed me that so often kills *DayZ* players. Even my commando captors couldn't protect me from a single hidden sniper with a bolt-action rifle. They couldn't even protect themselves.

When I respawned, three of the captors had logged off, and by the time I had run back to Chernobyl, they were all gone. Why did I run back that way? What possessed me to, unarmed, return the site of my slavery? Stockholm Syndrome? Maybe, but I think it's more subtle than that.

What I'd found in that hour or so was a sense of community, if not equality. I had been part of the most social event I'd seen in *DayZ*, even if it was a morbid sort of fraternity. That's why I didn't hit Esc. That's why I didn't run – if I had, I would have just died with a bullet in the back like every other time.

Civ 4 story - 16+ chapters - word count up to chapter 7 is 22000+

<http://forums.civfanatics.com/showthread.php?p=4651805>

Crusader

King

2

<https://forum.paradoxplaza.com/forum/index.php?forums/crusader-kings-ii-after-action-reports-aar.684/>

Story from reddit written by a player about a game of crusader kings.

Written by **my02 (reddit user name)** in **july, 2014**. **text copied directly from the discussion thread.**

http://www.reddit.com/r/CrusaderKings/comments/2bi79t/emergent_gameplay_narrative_how_ck2_generates/

867 Start - King of Asturias

In the year 867, Artal Mejor (character creator) ascended to the throne of the Kingdom of Asturias, which controlled Castille and Galicia. Artal decided to marry for political purposes. He found Helga, a quiet genius, in the courts of a German noble who was oblivious to her potential.

Within a few years, Artal and Helga welcomed Julius as their first son. Though not a genius, Julius was an excellent student. He would go on to become Duke of Leon, ensuring power and prestige for our patriarch's first line.

Soon after, Helga bore Artal II, a genius who would bring glory to the Mejor line. Some would call it opportunism. Others would call it the first steps towards a modern democracy. Either way, our noble Patriarch saw potential in all of his children and changed the succession laws for his realm to Elective Monarchy. Artal I, now dubbed The Wise, added the kingdom of Navarra to his control shortly before his death.

Artal II followed in his father's footsteps and also married a lowborn German genius. She bore Artal II one genius son before she died an untimely death from pneumonia. A heartbroken Artal II found some measure of company in a beautiful Irish lady named Rois who was not only quick but had excellent traits and skills in general. Rois bore Artal II six more children, including two genius daughters and one quick son.

Artal II's first son, also named Artal, grew up to be a brilliant strategist and holy warrior. Through a succession of wars he helped his father slowly acquire lands from the heathen Ummayids. Artal (of Denia) seemed an obvious choice to lead the growing kingdom after Artal II, but his dad had good reasons for being called The Wise like his own father Artal I.

Artal II's first daughter, Fronilda, was a genius was an excellent upbringing. Knowing he would need some help from his European neighbors, Artal II figured he should find a strong alliance with the marriage of Fronilda. He also had his eye on all of Aragon, the kingdom and eastern half currently ruled by a Karling king of Aquitaine. Artal II was astounded to find that King Louis of

Appendices

Aquitaine was willing to let his second son, Pierre, marry matrilinearly. Even more surprising was that Pierre was apparently the heir to the kingdom of Aragon.

Artal of Denia was still the heir apparent for Asturias, but Artal II rolled the dice and married his little genius angel to the Prince of Aquitaine. Prince Pierre happily set up house and home in Asturias. They would go on to have two sons and five daughters. The first son they named Pedro in 917.

King Louis of Aquitaine died in 913, leaving Aquitaine to Pierre's brother Aubry and leaving Aragon to Pierre and his and Fronilda's Meior children. In 914, Aubry was killed in battle fighting a rebellion in Barcelona. The rebellion was quickly crushed but both kingdoms now belonged to Pierre and his future children of my own family's line.

The next two decades were relatively peaceful, interrupted only about every decade while Artal II chipped away at the Ummayyids' hold on Southern Iberia. After tiring of peace treaties, he eventually sent his younger brother and chancellor to spread discontent in the heart of the heathen capital. Duke Garcia, Artal's beloved brother, was unfortunately captured and died in an Ummayyid prison. Garcia's work ultimately found success as the Umayyid juggernaut splintered into four regions.

King Artal II the Wise lived for a couple more years, passing of natural causes in 931. He left his kingdom to Fronilda, whose children would then be heir to Artal's four kingdoms plus those of Pierre, uniting all of the North of Hispania. Fronilda continued her father's work expanding South and conquered large amounts of territory as the Moors fought between themselves.

King Pierre of Aquitaine (and Aragon) lived for several more years, passing in 945 of natural causes. Later that same year, word reached Queen Fronilda that a Muslim adventurer was about to attempt to conquer her lands. She dispatched assassins to deal with this menace. They quickly botched the job and let the world know of her involvement. The second attempt was more successful, but an acquaintance of the adventurer quickly ordered a retaliatory strike at our Queen. Fronilda died mere months after Pierre, leaving all of their kingdoms to Prince Pierre.

While Artal II the Wise had merely set out to get a good alliance with his daughter's marriage and maybe get a toe-hold into Aragon, he had been lucky enough to give his grandson the entirety of Aragon and the powerful Kingdom Aquitaine. Within two years, King Pedro had used the

combined power of Asturias and Aquitaine to drive the Moors almost all the way to Gibraltar. In 947, Pedro was crowned Emperor of Hispania and dubbed The Great.

By 955, Emperor Pedro had completed the reconquista, conquering all of Hispania. Marriage ties and political circumstances had led the empire to include half of Brittany, most of Carinthia, and the Kingdom of Frisia. New areas were conquered so rapidly in the last three decades that counties and entire duchies were given to Meior men all throughout the family tree.

Many lands had their new lords still in diapers. Some Meior family branches had four brothers receive counties. Only blind luck and an ever vigilant spy-master prevented super duchies from forming from untimely death of some of the young counts. Having few direct male heirs meant that the dynasty head had ample time to educate many of these younglings.

Emperor Pedro remembered his great-Uncle Garcia II of Aragon and his sacrifice for the family. He quickly named Duke Garcia IV as King Garcia of Aragon. Emperor Pedro gave kingdoms to two other descendents of Artal II, as well as giving the Kingdom of Andalusia to Pedro's only son, Pedro II. Artal (the 5th), great-grandson of King Artal I, was given the Kingdom Frisia to honor the Meior patriarch and its namesake.

The emperor is now growing old. His son, King Pedro, is a decent chap but he is rather portly, not particularly distinguished, and he married a pretty but mediocre Frankish girl mostly to keep up appearances with the Aquitaine nobles. So far, Pedro II also only has one son. Should anything happen to that natural heir it's almost assured that the other powerful branches of the family will vote to install their own duke or king instead of a daughter of Emperor Pedro the Great.

It is now 969, slightly over a hundred years into the history of the Meior dynasty. According to the records of wise scribes, they control the Empire of Hispania, 22 kingdoms, dozens of duchies, and more land and soldiers than any other realm on Earth. Hispania has three Cardinals in the Papal College, usually averaging 3- 5, and so far has had one Pope from the realm. Christianity is at 100% Moral Authority thanks to the Reconquista. Karling Europe is apparently nonplussed about losing Aquitaine, content to fight over Bavaria and other realms that border their various kingdoms. The Abbasid Arabians control most of Arabia and North East Africa. The Byzantine Empire is content to keep the status quo, powerful, but not enough so to threaten the Abbasids or the combined Karling Kingdoms. With the Karlings fighting amongst themselves while simultaneously providing a buffer for Hispania, Emperor Pedro's greatest challenge will be to fight

complacency and secure peace long enough to change the succession laws and ensure his own line's continued power.

All the while, the rest of Europe continues mostly as expected. Ireland is still completely divided. England has a couple powerful dukes but no unity and half their land is controlled by the Norse. Scotland is mostly united as a single kingdom. Wales is split, with half controlled by the Petty King of Essex and the other half ruling Deheubarth as well as half of Brittany. Norway has bled to a large kingdom including much of Denmark. Hungary is unreformed pagan and under constant threat from Bavaria to the West and South, Greater Poland to the North, Ruthenia to the East, and a powerful, multi-county count to the East and South. East Francia and Italy are large and powerful kingdoms. Lotharingia is making an inspired come-back after nearly being split and absorbed by its cousin Karling neighbors. West Francia has numerous counts that have remained independent after various disputes. Christianity has conquered Hispania but paganism still rules the Norse and most of far-Eastern Europe, with the exception of the Orthodox in Ruthenia, Alan, and Pechenegs.

Written by **my02 (reddit user name)** in **June, 2014. text copied directly from the discussion thread.**

http://www.reddit.com/r/CrusaderKings/comments/2bi79t/emergent_gameplay_narrative_how_ck2_generates/

The young Emperor Mateuz paced the halls of his new palace in Krakow, pensively twirling his mustache with a grimace. His grandfather had left him with one of the greatest empires in Europe, second only to the Holy Roman Empire, yet he left it divided, the assimilated kingdom of Norway discontent and rebellious. But the war in the north, and the looming threats of Mongol invasion to the East were not what troubled the monarch. It was something much nearer to him.

Mateuz did not share a room with his wife. His dearly departed father, in his infinite wisdom, arranged a marriage for him in his adolescence to one of his vassals in order to strengthen his bonds within the newly acquired kingdom of Lithuania. And so it came to pass that the Prince was married to his cousin. They should have noticed something was wrong the first time she visited the Emperor's court. She thought the Grandpa Perzernyslaw's jeweled diadem was filled with the most delicious grapes and cherries. A poor squire had to follow her around for weeks in order to retrieve the rubies.

These last few weeks in power had been the most trying for the new Emperor. Host to his vassals and a plethora of well-wishers from within and without the realm, Ronana took a fancy to something that belonged to Prince Zelibrat Piast, the heir to the Kingdom of France. His new wife. Lacking the tact to

Appendices

make her desires known, Mateuz's wife shouted "NICE LADY!" at Sweitoslawa, and proceeded to grind her crotch up against the poor woman. In the middle of the late Emperor's funeral.

Needless to say, Mateuz kept her under close watch after that little incident. The virile ruler whisked his way up the tower he cloistered his wife in. Neither wanted anything to do with one another in the same bedroom. For entirely different reasons.

He threw the doors open to the Empress' chambers, and recoiled at the squalor that assaulted his senses. The stench of rotting food and unwashed bodies hit him first like a wall, the buzzing of flies permeating the room, only second to the sounds of disgusting eating. And the coup de grace, there sat Ronana on the bed, plump as a whale and naked, with a terrified looking servant girl huddled up next to her. Each hand occupied, one digging into a tub of butter, the other clenching a greasy chicken leg. The Empress glared her husband, and shouted, "Why you here, shithead?!" with a mouth foul and and full of fowl.

The stately young Monarch recoiled at once, hand covering his nose to block out her breath. "I only wished to speak with the servant, it will be just a moment."

The whale back spat in disapproval, both with spittle and with words: "She mine. You get own girl." Yet the half naked girl servant didn't seem nearly so happy with the arrangement, clutched possessively to Ronana's flabby bosom, matted hair full of crumbs and chicken grease.

The Emperor drew his sword, and the glint of light that caught it was enough to distract his wife. She liked shiny things. "I said I only need her for a moment. Now come along, girl." Ronana was stunned, looking at her own reflection dumbfoundedly as a hunk of butter flopped out of her mouth and onto her rotund stomach. Stunned enough to let the servant wriggle free and to the Emperor's side. He grasped her by the shoulder, led her out of the room, and slammed the door shut.

Turning aside to look sympathetically at the trembling girl he had in tow, Mateuz stroked his mustache and spoke softly, his words unheard under the yelling of the dullard in the next room who just realized she was tricked by her own reflection. He asked the girl, "How would you like to be free of the wretch, and make an awful lot of money?"

The girl nodded slowly, eyes still wide with fear, and the Emperor handed her a little packet. "Put this in her butter," he continued, still soft spoken, still calm. "You know she's soft for butter."

Giving her liege a puzzled look, the girl finally pieced it together and frowned, but nodded her reluctant agreement. "Good," replied the Emperor. "She's very fond of rich spices from the East. I'd do anything for my wife." He turned around and waved a hand to dismiss the servant, heading back down the steps, smile growing wider and wider as the childlike ranting and raving through the now-open door of the Empress' chamber grew louder.

"I hear the King of Lotharinga has a rather saucy young courtier he fancies. Talented, too," the Emperor said to himself, twirling his mustache, now with glee. "But I doubt he'll give her up. Now if only there were

Appendices

some way to get HIM out of the picture." The din of yelling behind him faded, replaced with the grotesque sloshing and gulping of a dullard packing pounds of butter down her fat face.

EVE

<http://sandciderandspacehips.blogspot.dk/p/fan-fiction.html>

Skyrim

http://www.reddit.com/r/skyrimstories/comments/35cxc9/story_the_rebirth_of_eldritch_grey/

Rimworld

<https://ludeon.com/forums/index.php?board=7.0>

TW:R2

<http://www.twcenter.net/forums/forumdisplay.php?1995-Total-War-Rome-II-AARs&s=5e68d3ed650f909b266d6d823571828c>

<http://www.gametactica.com/chapter-1.html>

EU

<https://forum.paradoxplaza.com/forum/index.php?threads/neapolitan-nightmare-a-naples-always-war-aar.857219/>

4

Appendix B - Reddit Posts

Here are links to each of the online surveys posts on Reddit.com

Day1

http://www.reddit.com/r/mountandblade/comments/36qwul/hey_rmountandblade_could_you_help_us_finish_our/

http://www.reddit.com/r/eu4/comments/36qxpp/hey_reu4_could_you_help_us_finish_our_master/

http://www.reddit.com/r/Eve/comments/36qys9/hey_reve_could_you_help_us_finish_our_master/

http://www.reddit.com/r/skyrim/comments/36r5ed/hey_rskyrim_could_you_help_us_finish_our_master/

http://www.reddit.com/r/dayz/comments/36r6jm/hey_rdayz_could_you_help_us_finish_our_master/

http://www.reddit.com/r/farcry/comments/36qyyv/hey_rfarcry_could_you_help_us_finish_our_master/

http://www.reddit.com/r/ThisWarofMine/comments/36r4ny/hey_rthiswarofmine_could_you_help_us_finish_our/

Day2

http://www.reddit.com/r/civ/comments/36v9l3/hey_rciv_could_you_help_us_finish_our_master/

http://www.reddit.com/r/Bioshock/comments/36va5u/hey_rbioshock_could_you_help_us_finish_our_master/

http://www.reddit.com/r/retrogaming/comments/36vajk/hey_rretrogaming_could_you_help_us_finish_our/

http://www.reddit.com/r/spelunky/comments/36vb3f/hey_rspelunky_could_you_help_us_finish_our_master/

http://www.reddit.com/r/thesims/comments/36vbh3/hey_rthesims_could_you_help_us_finish_our_master/

Day3

http://www.reddit.com/r/totalwar/comments/36zcpk/hey_rtotalwar_could_you_help_us_finish_our_master/

http://www.reddit.com/r/Minecraft/comments/36zcrf/hey_rminecraft_could_you_help_us_finish_our/

http://www.reddit.com/r/arma/comments/36zdm0/hey_rarma_could_you_help_us_finish_our_master/

http://www.reddit.com/r/battlefield_4/comments/36zelz/hey_rbattlefield_4_could_you_help_us_finish_our/

http://www.reddit.com/r/CrusaderKings/comments/36zevj/hey_rcrusaderkings_could_you_help_us_finish_our/

Appendix C - Survey site

Survey page 1 – Choosing the game

Narrative Research in Interactive Media

About Contact

Narrative Research Thesis

Please help us examine narrative in games by filling out this survey.

Hi there, Good citizen of the web.

Thank you for taking the time to help us finish our master thesis, and remember, if you complete the survey, you will get a chance to enter our prize draw for Steam gift cards.

If you would like to participate in the prize draw, please enter your name and contact email on the Demographics page of the survey. (Please see our [Privacy Policy](#))

The survey will, mostly, take the form of statements, that we would like for you to tell us how you feel about.

You will be asked to rate each statement, on a scale of strongly disagree to strongly agree.

Please select the game you are answering for:

Minecraft

Start Survey

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Survey page 2 – Emergent Narrative Questionnaire

In this first section we would like you to tell us how you feel about each of the following statements.

- 1 . While playing, I was more interested in creating my own goals than following the main objectives given by the game.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 2 . While I was playing this game, I was more interested in experiencing the game world and creating my own objectives, than following the main or side quests/objectives in the game.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 3 . The main character had different objectives than those presented in the main story.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 4 . If given the option, I would have made different choices than my main character.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 5 . My story was somehow special. I think I experienced a story that not many other people have experienced.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 6 . I found myself thinking about how the main character would react in situations not presented in the game.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 7 . I found myself thinking about the main character's background story, even information not presented in game itself.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 8 . On occasions i have found myself thinking about what I would do in the game, while not playing it.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 9 . While playing, I felt like my in-game decisions had no effect on the story I experienced.
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

- 10 . I feel strongly about my experience and would consider writing it up or talking about it to other people(either online, offline or both).
☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

Survey page 3 – Narrative Transport Questionnaire

Now we would like you to answer some questions about how you experienced the game.

11 . While I was playing the game, I could easily picture the events in it, taking place in the real world

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

12 . While I was playing the game, things going on in the room around me, were on my mind.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

13 . I could picture myself in the scene of the events I experienced in the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

14 . I was mentally focused on the game while playing it.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

15 . After the game ended, I found it easy to put it out of my mind.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

16 . I wanted to learn how the game would end.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

17 . The game affected me emotionally.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

18 . I found myself thinking of ways the game story could have turned out differently.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

19 . I found my mind wandering while playing the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

20 . The events in the game are relevant to my everyday life

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

21 . The events in the game have changed my life

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

22 . I had a vivid mental image of the main character's background.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

[Continue Survey](#)

Survey page 4 – Player Immersion Questionnaire part 1/3

Bear with us. You are about half way now.

Again, some questions about how your experience with the game has been.

23. I am familiar with the cultural background of the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

24. I am interested in the style of the game interface.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

25. The story quickly grabbed my attention at the beginning.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

26. Many events in the game's story are novel.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

27. I want to know the rest of the storyline in the course of playing.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

28. The avatar in the game is attractive.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

29. I concentrate on the story for a long time

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

30. I become less aware of the real world and unhappy things around me when I concentrate on the progress of the game's story

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

31. When I enter into the game's story world, time always flies quickly

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

32. I can make sense of the relationship between events.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

Survey page 4 - Player Immersion Questionnaire part 2/3

- 33 . I think the position of the events in the whole story's progress is clear
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 34 . When finishing an event, I know my next goal in the game.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 35 . I can clearly comprehend the game story.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 36 . I can easily spot my avatar in the interface.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 37 . I can make sense of the relationship between the characters in the game story
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 38 . The obstacles or tasks do not influence my comprehension of the game's story.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 39 . I can control the character to move according to my wishes.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 40 . I can control the game interface.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 41 . I explore, actively, what I want to in the game story
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable
- 42 . Parts of the story are formed by me in the course of playing the game.
- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

Survey page 4 - Player Immersion Questionnaire part 3/3

43 . Some tasks or conflicts in the story are stimulating and suspenseful.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

44 . I like the tasks or conflicts, which are difficult in the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

45 . I feel successful when I overcome the obstacles, tasks or opponents in the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

46 . Sometimes I think I really am the avatar in the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

47 . My emotions often vary with the story's progress

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

48 . After finishing the game, it takes a long time for me to return to the real world psychologically and emotionally.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

49 . I sometimes spend time thinking about the storyline when I am not playing the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

50 . Sometimes I recollect the characters in the game in my spare time.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

51 . I discuss my experiences in the game story with other players

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

[Continue Survey](#)

Survey page 5 – Game mechanic Questionnaire part 1/2

In this section we would like you to relate your answers to what is called Emergent Narrative.

An emergent narrative experience is something that happens to you as the player, as you progress and interact with the game world.

Under some circumstances the player might start experiencing events or “stories” that don’t tie directly into the storyline of the game, but rather are events that you feel are unique stories happening to you just because you chose to act in a certain way (and might not happen again).

In the game you played, did you feel like you had an experience of that kind? And please rate how you felt individual mechanics of the game helped you in experiencing that story.

51 . I think I experienced emergent narrative while playing the game.

- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

52 . The game world/world state changed based on my actions in the game.

- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

53 . The fighting with the different computer or player controlled enemy characters in the game.

- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

54 . Being able to craft specific items or objects that suited your play style or needs.

- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

55 . Exploring the game world and discovering new things or locations.

- ☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

Survey page 5 – Game mechanic Questionnaire part 2/2

56 . Gathering resources or loot from dead characters, chests or other containers.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

57 . Your interactions with the games non-player characters.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

58 . The openness of the world and the ability to go almost anywhere i wanted.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

59 . My interactions with other players in the game.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

60 . The appearance of random enemies around the game world.

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

61 . Every time you played the game the world was different

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

62 . The way you used and gathered the resources in the game, and having to think about how you would use or spend your resources

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

63 . Trading for resources with other factions, merchants or players

☐ Strongly Disagree ☐ Disagree ☒ Neutral ☐ Agree ☐ Strongly Agree ☐ Not Applicable

Continue Survey

Survey page 6 – Demographics

Almost there!

Please tell us a little about yourself. This will help us find interesting patterns in the final data.

Remeber to fill out the Name and Email fields, if you want to participate in the prize draw.

Name:

Email:

Nationality:

Gender: ☒ Female ☐ Male ☐ Other

Age:

Average hours playing computer games per week: **Required*

Estimate hours played of this game in total:

Continue Survey

Appendices

Survey page 7 – Bartle Test

Lastly is a Gamer Personality test, called the Bartle Test. However this is the icing on the cake for us. So if you are tired of questions and don't want to complete this section, you can just leave the 0's in the boxes. You will still be placed in the prize draw.

However, it would be fantastic for us if you would take this test for us. It takes about 5 minutes to go through, there are 30 questions that each have two simple answers.

If you do want to be a Good Guy Greg, please go to the link listed below and take the test.

Bartle Test site

You start the test in the top right of the page, where the first question appears like this.



And enter the numbers you get in the fields below. You will find your results in a box, just like this one:



Be aware that the boxes might be ordered differently. That is the Bartle site, listing your results in descending order.

Achiever: Explorer: Killer: Socializer:

Survey page 8 – Final Page

The End!

WOW! You are awesome.

Thanks a bunch for completing the survey for us.

You have been entered into the prize draw.

Remember, we will make the draw on the 15th of June and will contact the winners by mail directly.

We will also publish the results on this page at that time, so if you are interested:

Please check here: ☐

Appendix D - Table of Game Mechanics

ID	Game Mechanic	Description	Games
1	Character Interaction	Your interactions with other non-player characters in the game	The Sims 4 Bioshock Infinite Far Cry 4
2	Character progression	The progression of your main character or characters throughout the game	Mount & Blade: Warband Crusader Kings 2 The Sims 4 Total War: Rome 2 Rimworld Bioshock Infinite Battlefield 4 Far Cry 4
3	Character states/moods	The different feelings, opinions or needs expressed by the Non player characters	The Sims 4 This War of Mine Rimworld Bioshock Infinite
4	Changeable world	The game world/world state changed based on my actions in the game	Minecraft The Sims 4 Rimworld Bioshock Infinite Battlefield 4 Far Cry 4

Appendices

5	Combat	The fighting with the different computer or player controlled enemy characters in the game	Minecraft DayZ EVE Online Mount & Blade: Warband ARMA 3 Crusader Kings 2 Europa Universalis 4 Civilization 5 Total War: Rome 2 This War of Mine Rimworld Bioshock Infinite Battlefield 4 Far Cry 4 Spelunky Space Invaders Super Mario
6	Crafting	Being able to craft specific items or objects that suited your play style or needs	Minecraft EVE Online This War of Mine Rimworld
7	Diplomacy	When you were negotiating treaties or haggling with other factions	Crusader Kings 2 Europa Universalis 4 Civilization 5

Appendices

			Total War: Rome 2
8	Empire Management	Your control over your empire and how it developed	Mount & Blade: Warband Crusader Kings 2 Europa Universalis 4 Civilization 5 Total War: Rome 2
9	Exploration	Exploring the game world and discovering new things or locations	Minecraft DayZ Europa Universalis 4 Civilization 5 This War of Mine Battlefield 4 Far Cry 4 Spelunky
10	Factions	Your interactions with the different factions in the game	EVE Online Mount & Blade: Warband
11	God View	The fact that you did not only control a single character but rather had a god like view over the whole world	Crusader Kings 2 Europa Universalis 4 The Sims 4 Civilization 5 Total War: Rome 2 Rimworld

Appendices

12	Limited resources	The scarcity of resources and having to think about how you would gather and spend your resources	This War of Mine
13	Linear Quests	What was going on in the main storyline	Far Cry 4 Donkey Kong Super Mario
14	Looting	Gathering resources or loot from (Dead characters or chests)	Minecraft DayZ Mount & Blade: Warband ARMA 3
15	NPCs	Your interactions with the games non-player characters	Minecraft EVE Online Mount & Blade: Warband Crusader Kings 2 The Sims 4 Far Cry 4
16	Open world	The openness of the world and the ability to go almost anywhere i wanted	Minecraft DayZ EVE Online Mount & Blade: Warband ARMA 3 Battlefield 4 Far Cry 4

Appendices

17	Permadeath	The fact that once your character/s died, you would loose all your progress so far	DayZ This War of Mine Spelunky
18	Points	The process of gaining more and more points as you played the game	Spelunky Space Invaders Donkey Kong Super Mario
19	PvP interaction	My interactions with other players in the game	Minecraft DayZ EVE Online ARMA 3 Battlefield 4
20	Random Enemies	The appearance of random enemies around the game world	Minecraft
21	Random Quests	Getting random quests with varying goals and outcomes	EVE Online Mount & Blade: Warband Far Cry 4
22	Random world	Every time you played the game the world was different	Minecraft Spelunky
23	Resource management	The way you used and gathered the resources in the game, and having to think about how you would use or spend your resources	Minecraft DayZ EVE Online

Appendices

			Mount & Blade: Warband This War of Mine Rimworld
24	Survival	The focus on how you would survive in the game	DayZ This War of Mine
25	Trading	Trading for resources with other factions, merchants or players	Minecraft Mount & Blade: Warband
26	Increased difficulty	How the game increased in difficulty as you progressed through the game	Spelunky Space Invaders Donkey Kong Super Mario

Appendix E – Privacy Policy

PrivacyPolicy

Purpose for data collection: Our research focuses on interactive narrative in new media, with a special focus on emergent narrative in video games. The questionnaire is a part of a bigger thesis where we are looking for specific game design methods and mechanics that lead to people having stronger emergent narrative experiences in games. We are hoping to use our results to create a design framework which will increase a player's immersive experience in a video games storyworld.

When you participate in this survey, these main principles apply:

- We will under no circumstances share you personally identifiable information with unaffiliated third parties, Personally identifiable information is information such as your name, email address, forum user names or any other.
- Your responses in this survey are confidential and will not be published with any connection to your email address or other information.
- We will not sell your contact information to anyone, nor send you anything that you have not asked for. The only exception being, you winning the lottery for a steam gift certificate where we will contact you for further information regarding getting the prize to you.
- We use cookies to save info about if you have done the survey before, we do this to remember which games you have answered for and to see if people are sending in multiple submissions
- Your participation in a study is voluntary and any decisions will be respected.

Any questions concerning our policy should please be directed to nrimresearch@gmail.com