RESEARCH REPORT

The effect of story on player experience

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Figure 1: The Illustration.

FOREWORD

This report was written in order to reveal the layout of my research and show the documented findings of the research that was done on the effect of story on player experience for the thesis of my Bachelor of Communication. The research was done for the research group User Experience / User-centered Design of the Hanze University of Applied Sciences. The focus of the research group on user experience allowed me to conduct this research within the Institute of Communication, Media & IT, under the wing of the research group. The Hanze University of Applied Sciences was founded in 1986 and is the largest University of Applied Sciences in the northern Netherlands. This University houses the Institute of Communication, Media & IT, which is where I'm following the communication systems course; I majored in Game Design & Development and specialize as a writer and narrative designer. I was in the graduation period of the four year course when this research was conducted.

I would like to thank Eelco Braad for functioning as my first examiner and as my coach, the feedback was greatly appreciated. Secondly, thanks to Jef Folkerts for functioning as my second examiner during my graduation. Next to that, I also want to thank Wilko Peper and Hans Ottelé for green-lighting my research. Thanks go out to Edwin Turksema and Robert Gils for helping me program the games. Lastly, I want to give special thanks to Nick Degens for helping me start this research, which fit my interests perfectly and for functioning as my client.

SUMMARY

This research is about the effect of story on player experience; it aimed to explore the difference between gameplay and story in a player's experience and strived to measure it. The main problem for this research was one of knowledge; does story affect the player experience? Game creators often wonder if putting a story in a game is worth the time, money and effort. Does it affect the player experience in a positive way? Players wonder as well, if story even has a positive effect on player experience, putting gameplay and story up against each other. That is what this research is for, collecting information about the effect of story on player experience. The problem concerning the necessity of stories in games can be traced back to the long standing debate among the gaming community with two parties facing each other, one on the gameplay side and one on the story side. This also brings forth Clint Hocking's problem, ludonarrative dissonance, the unharmonious state of a game's gameplay and story, which, as he describes in his criticism piece Ludonarrative Dissonance in Bioshock (2007), can be experience breaking. Providing more information will hopefully make people think about the harmony that might exist between gameplay and story.

The objective of this research was to provide information to the research group User Experience/User-centered Design (the research group) concerning the effect of story on player experience by comparing the player experiences from experimentation with gamers on two different versions of the same game, one focused on gameplay, one focused on story; both of which were derived from exploring the corresponding theories concerning story and gameplay.

In order to complete the research, three research questions were formulated. The answer to each question furthered the research on to the next stage. The first question: "What information that will form a set of story parameters and a compatible game can be collected from the theoretical framework and how can this information be translated into two different versions of a game?" got its answer after the theories were thoroughly examined and brought to practical test. The answer to the first research question is as follows: "Chatman's diagram provided the set of story parameters (events and existents) which were translated into the Tetris-like game through Schell's String of Pearls method of story integration; this is the story version. Leaving the pearls (story) out left us with just the Tetris-like gameplay (string), which is also a game on its own; the gameplay version."

A hypothesis was formed as well, to see if expectations would be met, it is as follows: "The hypothesis of this research is that, of the two versions of the game (gameplay focused version and story focused version), the story focused version might improve the player experience on five of the Game Experience Questionnaire's (GEQ) six tested components over the gameplay focused version; namely immersion, flow, positive and negative affect and tension; whilst the remaining component, challenge might not differ from the gameplay version."

The answer to the first research question yielded the research perspective, in other words, the two versions of the game which were to be tested. The second research question was aimed at the testers, the people who played the different versions of the game; a player could be anyone, as long as they were able to play the game. A total of 20 tests took place; 10 tests for each version of the game. The second research question: "What are the reactions of the players, referring to the Game Experience Questionnaire, on the two different versions of the game?" is about the results of the GEQ. The answer to the second research question can be derived straight from the data gathered from the GEQ and is as follows: "The GEQ data shows that, in general, this group of players seemed more immersed when playing the story version, opposed to the gameplay version; the data also suggested that this group of players were more in a state of flow when playing the story version, even though the story version seemed to have less positive affect and more negative affect on these players' experiences over the gameplay version. The data for the story version implies that it provided slightly more tension than the gameplay version and a lot of the players from this test group found both games moderately to fairly challenging, the gameplay version seems to bring more challenge than the story version. The set of data for the challenge component is striking, since it is the one component where answers were expected to remain fairly equal, yet differ the most, compared to the data for the other components."

The third research question: “Which conclusions concerning the effect of story on player experience can be formed after comparing the experience of the players from the two different versions of the played game?” can be answered with the following conclusion, which is based on the gathered data: “Finally, it can be concluded that through testing with this particular group of people and the six of seven components used from the Game Experience Questionnaire; most of the hypothesis seemed to be inaccurate. To be more specific, the thoughts about the story version improving the immersion and flow components of the players’ experiences seemed to be correct with this group of players, but the thoughts about the positive affect, negative affect and tension components improving turned out to be faulty, as suggested by the data gathered from this group of players. The challenge component ended up not being equal in both version of the game either.

It can be concluded, looking back at the main problem for this research, which was one of knowledge; “does story affect the player experience?” that after the tests and data analysis, for this test group, story does indeed affect the player experience. The goal of collecting information for this problem has therefore been reached.”

CONTENTS

1. INTRODUCTION

This research is on the effect of story on player experience for the thesis of my Bachelor of Communication. This document may help third parties understand what this research is exactly about and it functioned as a guideline for myself throughout the graduation period. This research aimed to explore the difference between gameplay and story in a player's experience and strived to measure it. The problem that this research explored and that allowed it to be conducted inside of the research group User Experience / User-centered Design of the Hanze University of Applied Sciences is one of knowledge, the question if story affects player experience. This research explored that question by measuring player experience through the Game Experience Questionnaire (Poels, de Kort, & IJsselsteijn, 2007), by having players fill in the questionnaire after playing one of two different versions of the same game, one focused on gameplay, the other on story.

1.1 READER'S GUIDE

The structure of the report is based on Designing a Research Project (Verschuren & Doorewaard, 2010) and on the Institute of Communication, Media & IT's ICM Standard (Pratley & van Schie, 2011). The structure after this initial chapter is as follows; chapter 2, project scope, focuses on the research, the problem and the problem background, in which it can be found to whom it is a problem and why. Chapter 3 will describe the organizations that are connected to this research and the relation of these organizations to the problem. Chapter 4 will state the objective of this research; it will also show in which part of the intervention cycle this research can be found. Chapter 5 will focus on the research model. The research questions will be formulated in chapter 6; these questions are based on the research model and will carry the research from one stage on to the next. Chapter 7 will describe the research strategy and methodology. Chapter 8 will highlight the theories that were used to shape the research perspective. Chapter 9 will show the results that were gathered from the tests. Chapter 10 will derive conclusions from the results and the conclusions will be discussed in chapter 11, which is therefore named discussion, instead of the usual "advice", since this research is about providing information and leaving it open to discussion, instead of giving advice. To close the report, a final references chapter will conglomerate the sources used in this document and the appendices chapter will have room for any appendices that may be helpful in providing extra information.

2. PROJECT CONTEXT

This chapter focuses on the research, the problem and the problem background, in which it can be found to whom it is a problem and why.

2.1 THE RESEARCH

My own interest in story collided with the interest of the research group in affecting player experience of games. Previous negative experiences with implementing stories in games and the inherent ability of stories to affect users drew both myself and the research group toward the idea of researching the effect of story on player experience.

2.2 THE PROBLEM

The main problem for this research is one of knowledge; does story affect the player experience? Game creators often wonder if putting a story in a game is worth the time, money and effort. Does it affect the player experience in a positive way? Players wonder as well, if story even has a positive effect on player experience, putting gameplay and story up against each other. That is what this research is for, collecting information about the effect of story on player experience.

2.3 THE PROBLEM BACKGROUND

The problem concerning the necessity of stories in games can be traced back to the long standing debate among the gaming community with two parties facing each other, one on the gameplay side and one on the story side. Comments on a thread from the website comic vine can be viewed as an example of the two parties; comments like those of Zijuun can often be found to represent the gameplay side: “In a game? Obviously gameplay. I don’t care much for the story that’s why I always press the skip button. If I want a story I’ll go read a book, thank you very much.” (Comic vine, 2013) The opposing side often delivers comments like RedLantern23’s: “Story. Look at The Walking Dead. It got multiple game of the year awards and I’ve heard many people say it was the most refreshing game they’ve played in years, even bringing tears to some people’s eyes. No one is saying that because of the gameplay. The narrative is what drove the game. THAT’S a good game, not half of the triple A garbage being produced right now.” (Comic vine, 2013). It shows that the opinions of players are very much divided between the two subjects, gameplay and story.

This also brings forth Clint Hocking’s problem, ludonarrative dissonance, the unharmonious state of a game’s gameplay and story, which as he describes in his criticism piece Ludonarrative Dissonance in Bioshock (2007) can be experience breaking. Providing more information will hopefully make people think about the harmony that might exist in gameplay and story.

For game creators it has mostly been about the time, money and effort of putting a story in a game that begs the questions if it is actually worth putting a story in a game. From both my own experience and speaking to other game creators, it can be said that this is indeed a problem worthy of research.

3. ORGANIZATION

The organizations that are connected to this research and the relation of these organizations with the problem will be described in this chapter.

3.1 THE RESEARCH GROUP USER EXPERIENCE / USER-CENTERED DESIGN

The research group User Experience/User-centered Design operates from the Hanze University of Applied Sciences (the research group); its focus is on developing and applying knowledge to shape the influence of multimedia tools on the behaviour and experience of users. It has previously worked on serious games to aid revalidation of people with physical traumas and looked at a low cost solution for physiotherapy that is fun to use. Adaptive experiences are also in the research group's projects; changing the user's experience through a game that adapts to the user's actions. Examples of research topics include optimizing system interaction by understanding the relationship between the user experience and system parameters; creating clear links between system mechanics and parameters and leveraging system mechanics to instill a specific user experience in the end user.

The research group's main focus is to studies three subjects in particular to further the theoretical and technical fields; usability and user experience of user interfaces of systems, intuitive & motivating virtual environments and behavioural, cognitive and affective changes on users of web and games. This research on the effect of story on player experience falls into the last subject category. The main problem, the question if story affects player experience, is a rising topic in the game industry, especially now that games' narratives become more and more of a focus for game creators and their audience. This research will feed the research group information about the effect that story has on a player's experience.

3.2 DZYAN WATTIMENA

I, Dzyan Wattimena, am a writer & narrative designer and a fourth year student at the Hanze University of Applied Sciences. I major in Game Design & Development from the communication systems course. I am 21 years of age at the time of writing. What drew me toward this research topic was the debate that puts gameplay and story up against each other; it affects not only the writer in me, but also the game designer. Implementing story in a game has always been a topic of discussion in most every cooperative school project I worked on in the last four years. I leaped at the opportunity when the research group's interests collided with my own to form this research on story and its effect on player experience.

4. RESEARCH OBJECTIVE

This chapter will state the objective of this research and it will show in which part of the intervention cycle this research can be found.

4.1 THE RESEARCH OBJECTIVE

The research objective connects the work done within the research (B) with the end goal of the research (A). The research objective is to:

> *(A) provide information to the research group User Experience/User-centered Design concerning the effect of story on player experience*
>
> by
>
> *(B) comparing the player experiences from experimentation with gamers on two different versions of the same game, one focused on gameplay, one focused on story; both of which are derived from exploring the corresponding theories concerning story and gameplay.*

4.2 THE INTERVENTION CYCLE

The intervention cycle is a model used to solve problems, but this research merely explores the problem, so the connected entirety of the intervention cycle will not be used; nonetheless, one of the separate phases of the cycle is useful for this research, since it is about exploring a question. The problem analysis phase will be used for this research because the main problem will be explored through experimentation on player experience by presenting the player with two different versions of the same game; one focused on gameplay and one focused on story.
This research is purely about gaining information, not solving a problem.
See "Figure 2: The intervention cycle" for a representing image.

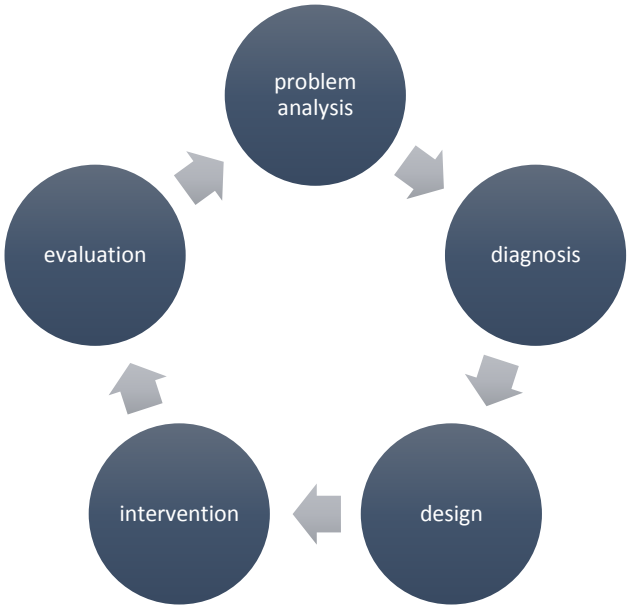

Figure 2: The intervention cycle (Verschuren & Doorewaard, 2010).

5. RESEARCH MODEL

This chapter will focus on the research model.

5.1 THE RESEARCH MODEL

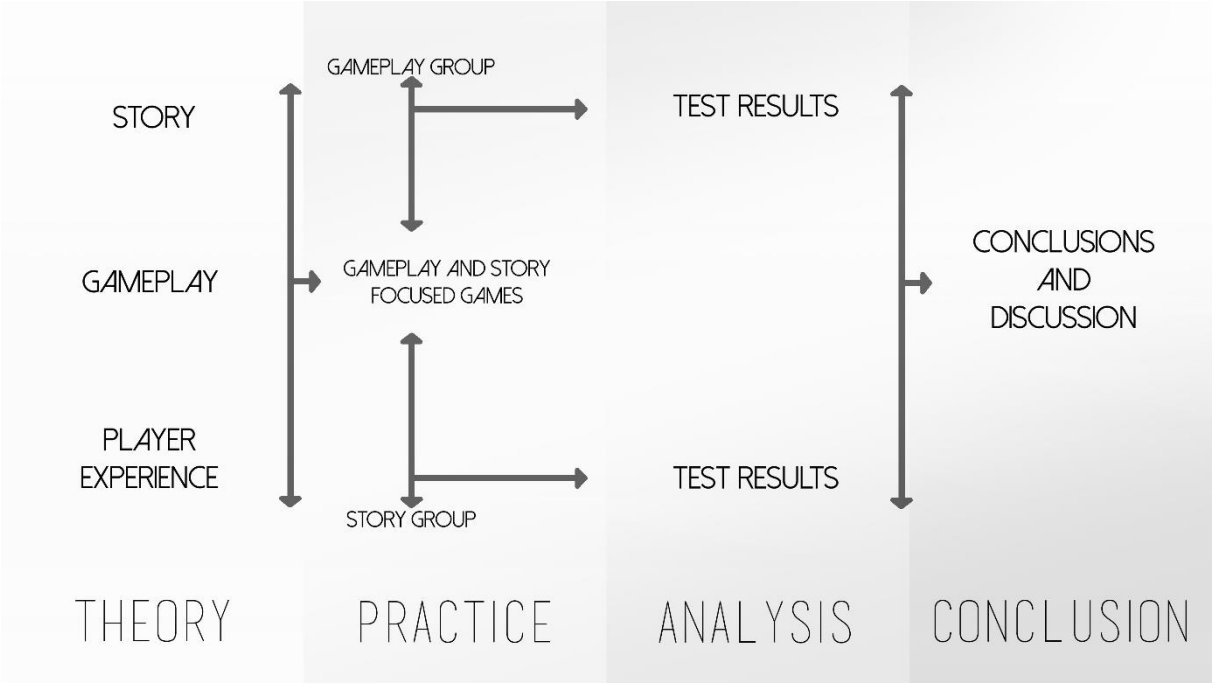

Figure 3: The research model.

5.2 EXPLANATION OF THE RESEARCH MODEL

See "Figure 3: The research model" for an image of the research model. The research model divides the entire research into four parts. The focus of the first part will be exploring theories on which this research can be based. The second stage, practice, will be about the practical side of the research, the actual experiments. The research model shows that combining the three core concepts from stage one creates a set of two games with different focuses (the research perspective). The different games are created for the purpose of the experiments which will be conducted in stage two, practice. The two different games each have their own separate test group (research object), as seen in the research model. Each research object consists of a group of players; these players can be anyone, as long as each group has the same amount of players in order to obtain legitimate medians from the test results. The aim for the size of the groups is at least 10 players per test group; this is doable with the time restraint in mind and still makes sure that a solid median of the test results is achievable. The measured results from all of the experiments will lead to the third stage, analysis. In the analysis stage, test results will be compared and analysed in order to work toward the last stage, conclusion, where conclusions will be drawn from the compared test results. Finally, discussion may be initiated, derived from the conclusions that were formed about the effect of story on player experience.

6. RESEARCH QUESTIONS

The research questions will be formulated in this chapter; these questions are based on the research model and will carry the research from one stage on to the next.

6.1 RESEARCH QUESTION 1

What information that will form a set of story parameters and a compatible game can be collected from the theoretical framework and how can this information be translated into two different versions of a game?

Sub-question 1:
What is the most usable collection of elements to create a story from?

Sub-question 2:
Which gameplay type is best to form a compatible game for this research (with the time constraint in mind)?

6.2 RESEARCH QUESTION 2

What are the reactions of the players, referring to the Game Experience Questionnaire, on the two different versions of the game?

Sub-question 1:
What are the reactions of the players on the gameplay version of the game?

Sub-question 2:
What are the reactions of the players on the story version of the game?

6.3 RESEARCH QUESTION 3

Which conclusions concerning the effect of story on player experience can be formed after comparing the experience of the players from the two different versions of the played game?

7. RESEARCH STRATEGY

The research strategy and the methodology will be described in this chapter.

7.1 RESEARCH STRATEGY

The research strategy used in this research is the experiment strategy from Designing a Research Project. An experiment is an empirical, quantitative type of research strategy. An experiment can be explained as follows: "One group receives a treatment or an intervention, to be indicated as X, and the other does not, or it receives a different treatment. Afterwards, the two groups are compared by means of an ex-post measurement of the expected effect Y." (Verschuren & Doorewaard, 2010). To put the strategy in perspective for this research; two different groups are established, each group will play one version (out of two) of, gameplay-wise, the same game. Afterwards, the groups will be compared by means of a questionnaire in order to measure the player experience. The questionnaire that will be used is the Game Experience Questionnaire (GEQ) (Poels, de Kort, & IJsselsteijn, 2007).

7.2 METHODOLOGY

The methodology of this research is the way that each of the three research questions will be answered; how each question will be answered follows hereafter.

The first research question: *What information that will form a set of story parameters and a compatible game can be collected from the theoretical framework and how can this information be translated into two different versions of a game?*

To more easily answer this question, two sub-questions will first be answered; the combined answers of the two sub-questions will form the answer of the first research question:

- Sub-question 1: *What is the most usable collection of elements to create a story from?*
- Sub-question 2: *Which gameplay type is best to form a compatible game for this research (with the time constraint in mind)?*

The answers to the sub-questions and finally the first research question lie in the literature specified in the theoretical framework; examination of the literature will most likely grant the answer, literature is the source of knowledge.

The second research question: *What are the reactions of the players, referring to the Game Experience Questionnaire, on the two different versions of the game?*

The answer to the second research question lies in the results of the experiments. To prepare for the answer of this question, the lay-out of the experiments will follow.

The two different versions of the game will be uploaded online and players who are allowed access will be assigned one of two different versions (each version will be clearly numbered, i.e. V.1 or V.2).
The player will be able to play where they can and whenever they have the time, as long as there is a stable internet connection. After playing the designated version, the player will be guided to the online Game Experience Questionnaire on Survey Monkey. Survey Monkey is an online tool that helps researchers digitize their surveys and questionnaires, which can then be sent to test subjects all over the world; a more efficient way to reach a larger audience, which is the reason Survey Monkey has been chosen. The first question of the survey will have the player specify the version that they played; this will connect the results of the questionnaire to the different versions. After specifying a version, the player will be taken to the GEQ and asked to complete the questionnaire. The collected data from the questionnaire will be available for review and analysis on Survey Monkey (not available to participants).

To further divide the second research question, two sub-questions tackle the reactions of the players for each subsequent version of the game. The two sub-questions are as follows:

- Sub-question 1:
  What are the reactions of the players on the gameplay version of the game?
- Sub-question 2:
  What are the reactions of the players on the story version of the game?

Answering the two sub-questions, based on the reactions of the players recorded through the GEQ, will yield the answer to the second research question.

The third research question: *Which conclusions concerning the effect of story on player experience can be formed after comparing the experience of the players from the two different versions of the played game?*

The data from the experiments have to be analysed to answer the third research question. Survey Monkey has specific tools that help with processing the gathered data; these tools will be used to help analyse the data and create visual support to make the data easier to read. The conclusions will be based on the analysed data.

8. THEORETICAL FRAMEWORK

This chapter highlights the theories that were used to shape the research perspective.

8.1 THEORIES

The theories used in this research are divided into three core concepts; story, game design and measurement. The books used for this research were chosen specifically for their insight on topics that were likely usable to shape the research perspective; providing guidelines for game design and the parameters for conveying story.

8.2 STORY

The story concept covers story and interpretation. Interpretation is placed with story because it is an important concept used to instill a story with a larger meaning for the target audience. Two books will be consulted. These books explain story & discourse and interpretation. The specific books chosen for this research deconstruct story; this helped uncover a way of conveying story to players.

In the story concept: Story and Discourse (Chatman, 1978) proposes a structure for narrative; breaking narrative down into story and discourse, the content of and the way that a story is presented to the audience. The further deconstruction of story was one of the necessary ingredients for the research perspective. The breakdown of stories provided important information about setting up parameters that define story. Vladimir Propp's Morphology of the Folktale (1968) was also considered usable for its deconstruction of stories, but Propp's book was too specifically tailored to fairy tales; this didn't fit the research, which needed a more general overview of what stories deconstruct to. Chatman provides the reader with a great diagram that gets expanded over the course of the first chapters, as he explains which specific elements need to be present in order for a story to form.

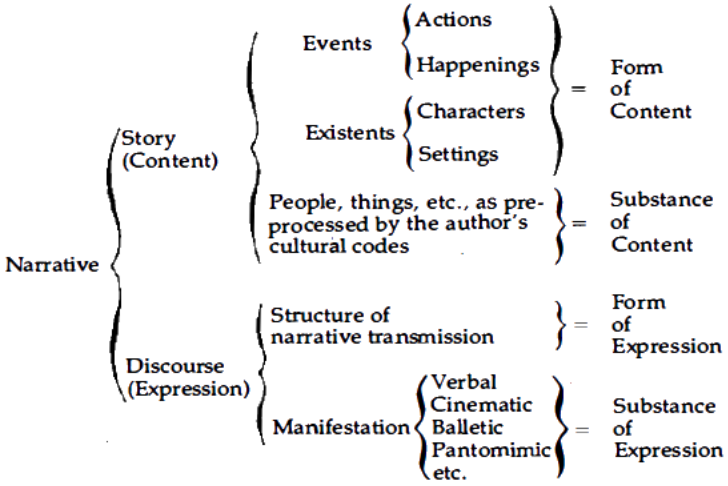

Figure 4: Narrative diagram (Chatman, 1978)

This research focuses mostly on the top half of the diagram; figure 4 shows that story exists of a form and substance. The form of a story are the actions and happenings (grouped as events) and the characters and settings (grouped as existents). The substance of story can be seen as the meaning behind the form, or as Chatman quotes John Lyons: "the whole mass of thoughts and emotions common to mankind independently of the language they speak." (Introduction to Theoretical Linguistics, 1969) The lower half of the diagram actually represents the medium used to convey the story to the audience, in the case of this research the bottom part, or the discourse, is the playable video game. Chatman's diagram adequately deconstructs the concept of story down to the elements that make it up, which was exactly what was necessary to answer the first sub-question: *what is the most usable collection of elements to create a story from?*

The second book in the story concept, S/Z (Barthes, 1974), brought information about interpretation and how it works for readers and writers. Barthes specifies two types of writing; the *readerly*, where little to nothing is left for the reader to interpret in their own way and the *writerly*, where a lot is left for the reader to interpret in their own way. These are two of the most important concepts of S/Z. Barthes prefers the writerly way of writing, where the reader is no longer a consumer of the text, but a producer. A writerly text makes the reader think, it gives the reader the opportunity to shape the meaning of the text in their own way, but it is a very abstract concept. The majority of modern texts are readerly texts; for good reason. The readerly text places the reader in a more passive state, it doesn't leave a lot of room for interpretation, in comparison with the writerly text; Barthes describes it as limited plural, because several words will always have multiple meanings, though this may also be used by the writer as a tool to improve the readerly text. What makes the readerly text more popular and very strong is that it is specific. Writers can craft their perfect story, everything is in their control. Readers don't mind this either; they seemingly mind it so little that writerly texts are hardly found anymore. Still, the writerly does have something going for it; making people think, making them producers instead of mere, passive consumers expands the book as a medium in my opinion.

Another important concept that Barthes discusses in S/Z is connotation. Connotation means that each word can carry a legion of different meanings; it is the worst enemy of every philologist, those who adore structure, simplicity and wish for every text to be univocal (i.e. one way to interpret a text). But for a novelist, an artist, connotation is beauty; it is the written equivalent of a symphony, where music can only exist through a succession of melodies, note after note, building on the foundation left by that which came before it. Connotation taps into the plurality of a text by granting a word a certain emotional meaning, a meaning which can only be uncovered by reading previous sections, sentences that came before it that give that word its color, its shape, its sound, its meaning.

Barthes explores his hypothesis of the readerly and writerly by decomposing Honore Balzac's Sarrasine. He connects five codes to sections of the text; hermeneutic (textual interpretation), proairetic (action), semantic (emotional connotation), symbolic (extra meanings) and cultural (shared knowledge of the population). These codes are then used to determine if the text is a readerly or a writerly text.

8.3 GAMEPLAY

The skeleton of the testable game, the one thing that stays the same in the two versions of the game, is the gameplay; this had to be designed in such a way that it could remain identical across both different versions. The game design category was covered by Jesse Schell's acknowledged book The Art of Game Design A Book of Lenses (2008). For this research the most usable subjects and opinions from his book were used. Schell's book uncovers the elements that a game consists of; it break down games, much like Chatman's theory from the story concept break down stories. The Art of Game Design A Book of Lenses provided the theory on which the game's dual design was based; one version focused on gameplay, the other on story. It goes through the entire process of making a game, from getting an idea to executing that idea and eventually selling it. He elaborates four fundamental elements that can be found in most games:

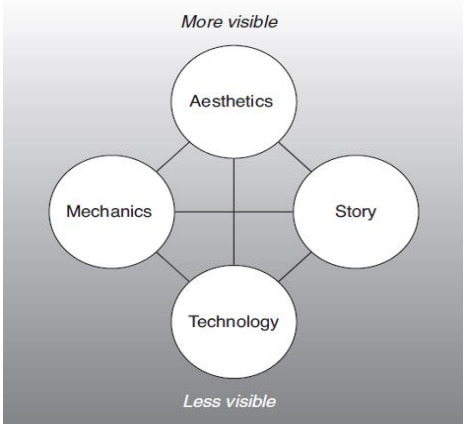

Figure 5: Four elements (Schell, 2008)

Figure 5 shows the four elements that are common in most games. Schell makes the distinction between a game's skin and its skeleton. The four elements can be partially divided among the two parts of a game; a game's mechanics and technology being the skeleton, the mostly invisible part that keeps the entirety on its feet and a game's aesthetics and story, the visible part that influences the player's emotions and experience. The two versions of the game have the same mechanics and technology, but the story and aesthetics differ; this kept the games fundamentally the same, but may have influenced the players' emotions and experience.

The actual gameplay of both versions, the skeleton, was based on an all-round favourite in the non-story games category, namely Tetris (Pajitnov, 1984). The reasonably straight forward gameplay of Tetris seemed recreatable in the short time that was available. An extra challenge was merging Tetris' age old gameplay with a story; the first stream of thought questioned if that was even a possibility. Tetris is mainly known for its lack of story, so putting a story in a game reminiscent of Tetris would surely turn some heads. This, in combination with Schell's theories, the String of Pearls and the four basic elements of a game answered the second sub-question, w*hich gameplay type is best to form a compatible game for this research (with the time constraint in mind)?*

8.4 PLAYER EXPERIENCE

The theory for player experience was about measuring it; the reason why measuring the player experience is present in the theoretical framework, is because what needed to be measured for gameplay and story specifically was still a question. Measuring the player's experience in the practical stage of the research was done by letting the players from the different test groups fill in the Game Experience Questionnaire (GEQ) (Poels, de Kort, & IJsselsteijn, 2007), which covers a wide area of the player's experience. Questions from Measuring Narrative Engagement (Busselle & Bilandzic, 2009) and The Flow Condition Questionnaire (Schaffer, 2013) were considered, but the GEQ's rounded approach to measuring more of the whole of the player's experience, instead of a smaller part of the experience, made it more useful for this research. Previous experience with the GEQ also helped in the testing phase of the research. The GEQ assesses the psychological impact of games; it covers seven components; immersion, flow, competence, positive and negative affect, tension, and challenge. Which of these components belong to the story parameters and which of these to the game's gameplay was part of the research and the reason why player experience is present in the theoretical framework. The GEQ offers a list of 33 questions which forms a robust questionnaire to help researchers assess the psychological impact of a game on a player. From initial research, it seems that of the seven components; immersion, flow, positive and negative affect and tension might be enhanced by the story version. Challenge, being a core mechanic of gameplay might stay the same. Some of the components may also overlap, like flow and positive and negative affect. One unnecessary component was removed that did not have additional value to this research, competence, which had five questions connected to it, was taken out of the final questionnaire, leaving the test subjects with 28 GEQ questions to be answered. This also made the questionnaire a bit more digestible for subjects and saved them time.

8.5 HYPOTHESIS

The hypothesis of this research is that, of the two versions of the game (gameplay focused version and story focused version), the story focused version might improve the player experience on five of the GEQ's six tested components over the gameplay focused version; namely immersion, flow, positive and negative affect and tension; whilst the remaining component, challenge might not differ from the gameplay version. The difference between the gameplay and story versions of the game are based on the division from Chatman's book Story and Discourse (1978), in which a diagram shows that the following elements define story: the actions and happenings (events) and the characters and setting (existents). Games being a visual medium; the simulated environment (setting) and aesthetics and actions of the characters will also portray story elements, next to written text (or spoken voice-over); so these will also differ from the gameplay focused version, as opposed to the story focused version. What the gameplay encompasses can be described in the words of Rollings and Adams, who say that gameplay is: "One or more causally linked series of challenges in a simulated environment." (2003); this will remain the same in both versions of the game.

8.6 SUM OF THE THEORY

The research perspective was created after consulting several books and theories, specified in paragraphs 8.2, 8.3 and 8.4. This paragraph will focus on how these books and theories were synthesised into the research perspective. To keep it structured, the gameplay will be discussed first, then the story and finally the different experiences that both versions of the game provide.

The gameplay, which is exactly the same in both versions of the game, is derived from a well-known classic game: Tetris. Instead of a single field like in Tetris, there are two fields, a red and a blue field on which to place the correspondingly coloured blocks (or carts in the story version). The gameplay version had to be designed in such a way that it was playable on its own, but was also open to a story insertion. Taking the available time and human resources into account was a key element in the design phase.

A practical way to put an interesting story into the designed game emerged from blending the most useful elements (in this particular situation) of S/Z (Barthes, 1974) and what was learned from Story and Discourse (Chatman, 1978). Jesse Schell's string of pearls method (The Art of Game Design A Book of Lenses, 2008) formed the basis of the story's discourse, the way that the story is conveyed, but the game is not merely a succession of story bits (string) and gameplay bits (pearls); hints of the story are intertwined in the gameplay bits as well, through the game's visual aspect.

Table 1: Difference between the two versions

Schell's four elements	**Gameplay focused version**	**Story focused version**
Aesthetics	Abstract background and effects + tetris-like blocks	Snowy forest + blocks become carts
Story	No hints of story	Spy infiltrating Soviet Russia (adds events and existents)
Mechanics	Tetris-like gameplay, separated to two fields, as opposed to one	Tetris-like gameplay, separated to two fields, as opposed to one
Technology	Unity-engine for PC, controlled by mouse	Unity-engine for PC, controlled by mouse

The above table shows the differences between the two versions of the game. The mechanics and technology do not differ; it is only in the story and aesthetics elements that the versions vary. The table represents the answer to the first research question. The question being as follows: *"What information that will form a set of story parameters and a compatible game can be collected from the theoretical framework and how can this information be translated into two different versions of a game?"*
The answer can be deducted by combining the two sub-questions answered through exploration of the theoretical framework and is as follows: Chatman's diagram provided the set of story parameters (events and existents) which were translated into the Tetris-like game through Schell's String of Pearls method of story integration; this is the story version. Leaving the pearls (story) out left us with just the Tetris-like gameplay (string), which is also a game on its own; the gameplay version.

9. RESULTS

This chapter will show the results that were gathered from the tests.

9.1 THE GAME EXPERIENCE QUESTIONNAIRE (GEQ)

The following hypothesis was to be tested: "Of the two versions of the game (gameplay focused version and story focused version), the story focused version might improve the player experience on five of the GEQ's six tested components over the gameplay focused version; namely immersion, flow, positive and negative affect and tension; whilst the remaining component, challenge might not differ from the gameplay version." In order to test the hypothesis, testers (players) were asked to fill in the Game Experience Questionnaire. The GEQ version that was used for this research consisted of 28 questions, covering six components. After the players played through either the story version or the gameplay version (whichever got designated to them) from start to finish, they were guided to the GEQ. The last screen of both games contained a link which guided both groups of the testers to the GEQ (online on SurveyMonkey). Before starting the actual questionnaire though, testers were asked to specify which version of the game they played, their gender, their age and if they often play games (and on which device/which games). After the testers filled in the initial questions, they were guided to the actual GEQ. The GEQ is a proven method of testing player experience, created by IJsselstijn, W.A., De Kort, Y.A.W. & Poels, K. from the Technical University Eindhoven. Most of the 20 testers ranged from ages 17 until 29 with two testers above the age of 55. 35% of the testers were female and 65% were male. Testers' experience with games was quite diverse, but all of them had played games before, as players stated in the open question before the actual GEQ. The five options "not at all", "slightly", "moderately", "fairly" and "extremely" of the questions indicate the scale that the players thought best represented how they felt during the play session. For example: a player selecting "extremely" on a question that is inside the immersion component tells us that the player felt extremely immersed during the play session in the particular aspect that is being questioned. To get to the specific form of the GEQ data as shown in 9.3, several things had to be done. First, all 28 questions needed to be grouped according to the components of the GEQ, the flow component for example had 5 questions in its group. Secondly, in order to get an average for every component, the GEQ data was loaded into Microsoft Excel and placed as shown in table 2. The numbers behind the options and under each question represent the amount of testers that selected that particular option (for example "slightly") when presented with a question (for example "question 5"; the amount of people that selected "slightly" for this question would be 4).

Table 2: Example of GEQ Excel sheet

Options	*Question 1*	*Question 2*	*Question 3*	*Question 4*	*Question 5*
Not at all	0	2	3	1	2
Slightly	2	2	2	1	4
Moderately	2	3	4	3	3
Fairly	3	2	0	3	1
Extremely	3	1	1	2	0

Lastly, the average of each of the five options could be calculated; this was done by adding up the amount of people who selected a specific option and dividing that total by the amount of questions present in the component.

9.2 TWO TYPES OF TESTS

The tests were divided among two different circumstances; reaching a larger group of testers was made possible through the two types of tests, it was not about getting different results, it was about attaining more data. Most tests were done physically, on the developer laptop with myself present to guide the tests, but there were also several tests done via the Unity web player application; this allowed people who

couldn't attend the physical tests to participate via the online version (the GEQ being on SurveyMonkey enabled these testers to also fill that in remotely, on the same computer that they played on). However, the Unity web player version of the game still had several bugs that came with exporting it as a web player application, so these testers got a set of instructions to help minimize the interference of any technical errors caused by the bugs. The utmost care was taken to ensure the legitimacy of the data; the testers got a reminder that their answers remained anonymous and they were left in private to fill in the GEQ. Any questions were remotely answered through text messaging or a blind conversation.

9.3 GAME EXPERIENCE QUESTIONNAIRE DATA

Below is the data from the game experience questionnaire, combined for the six components that were used. The numbers shown in the graphs below are averages of the testers who filled in the GEQ. The orange bars represent the data gathered from the testers who filled in the GEQ after playing the gameplay focused version of the game; the blue bars represent the data from the testers who played the story focused version.

9.3.1 IMMERSION

The immersion component of the GEQ featured six questions like: "I felt imaginative" and "I found it impressive". It is used to measure sensory and imaginative immersion of a player, or how much that player felt present in the game. Figure 6 suggests that this group of players seemed to be more immersed whilst playing the story version, as it scores slightly higher in the "fairly" and "extremely" options and lower in the "not at all" option.

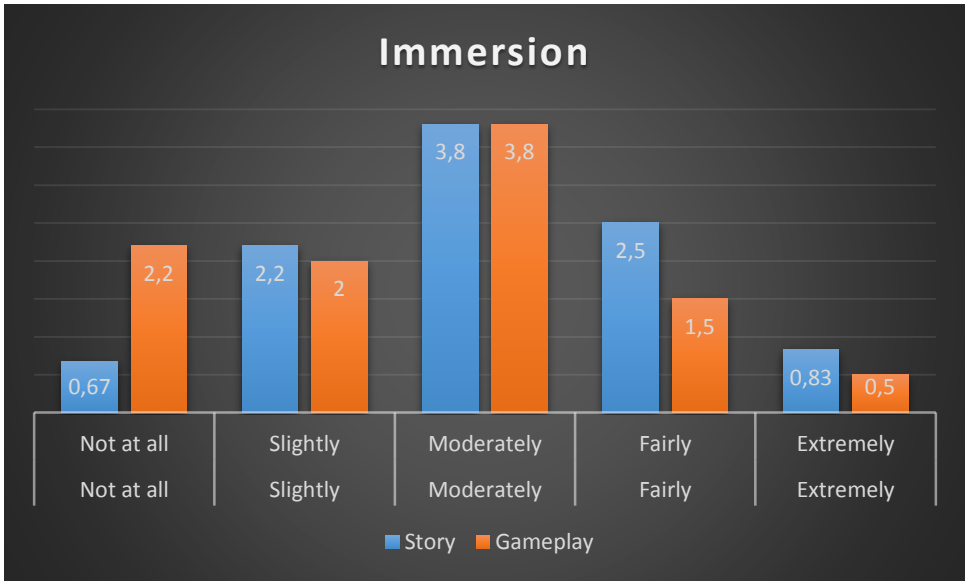

Figure 6: Data for immersion

9.3.2 FLOW

Present in the flow component are five questions in the trend of: “I was fully occupied with the game” and “I forgot everything around me”. The flow component is used to gauge players’ state of flow, or how much they felt invested into a game or activity (losing track of time is a sign of flow). Figure 7 implies that the difference of this group of players being in a state of flow while playing the story and gameplay versions seems to be quite even, with the same scores in the “not at all” and “slightly” options, a slight lead for the story version in the “moderately” and “extremely” options and a lead for the gameplay version in the “fairly” option.

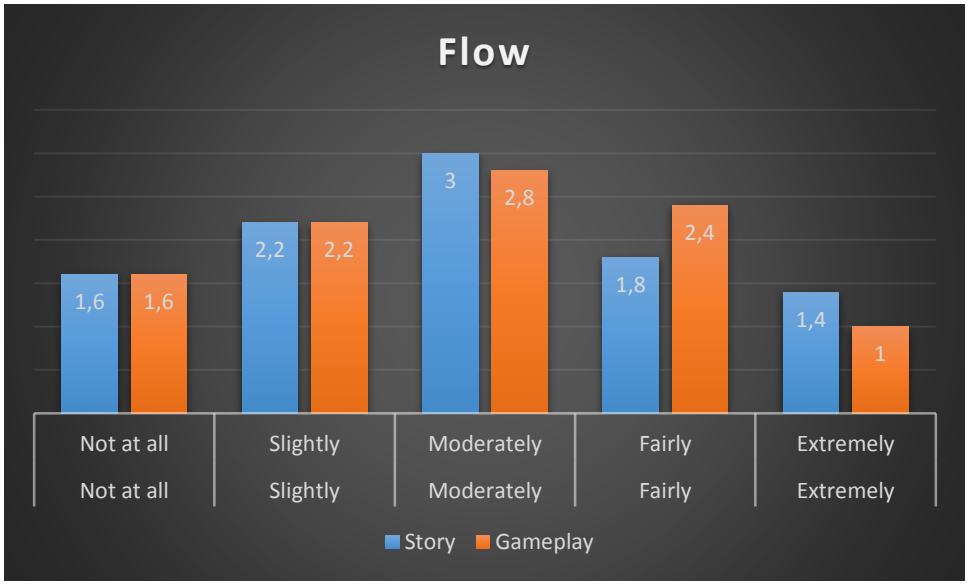

Figure 7: Data for flow

9.3.3 POSITIVE AFFECT

The positive affect component has five questions like: “I thought it was fun” and “I felt happy”. Positive affect is used to measure a players’ positive feelings whilst playing a game, in other words, to discover their happiness level and if they liked the game. Figure 8 suggests that the gameplay versions scores a bit higher in the positive affect component, since it scores slightly higher in the “moderately”, “fairly” and “extremely” options.

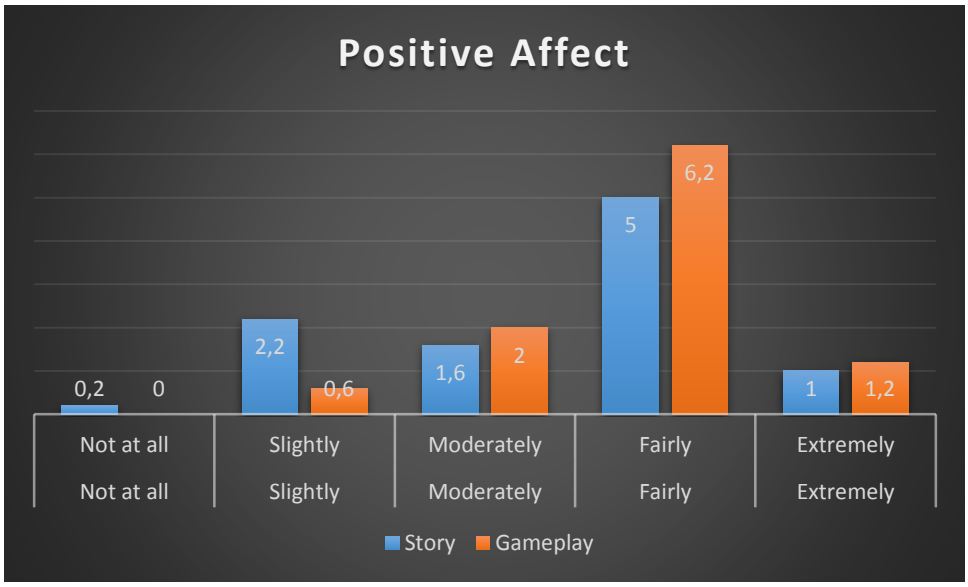

Figure 8: Data for positive affect

9.3.4 NEGATIVE AFFECT

The GEQ's negative affect component features four questions similar to: "It gave me a bad mood" and "I thought about other things". Negative affect is used to measure players' negative feelings and their willingness to put energy into the activity at hand (higher scores in the later options "moderately", "fairly", "extremely" represent less willingness to put energy into the activity). Figure 9 implies that the story version has a slight edge in the negative affect component, since it scores slightly higher in the "fairly" option.

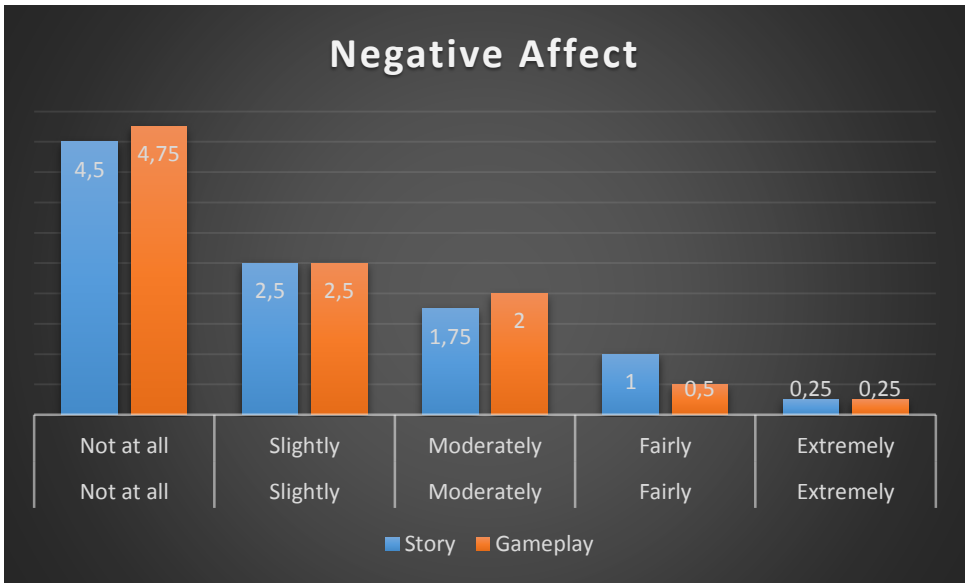

Figure 9: Data for negative affect

9.3.5 TENSION

The tension component features three questions in the trend of: "I felt frustrated". Tension is used to measure how frustrated or annoyed players were while playing the game. Figure 10 suggests that this group of players felt slightly more tension whilst playing the story version of the game over the gameplay version.

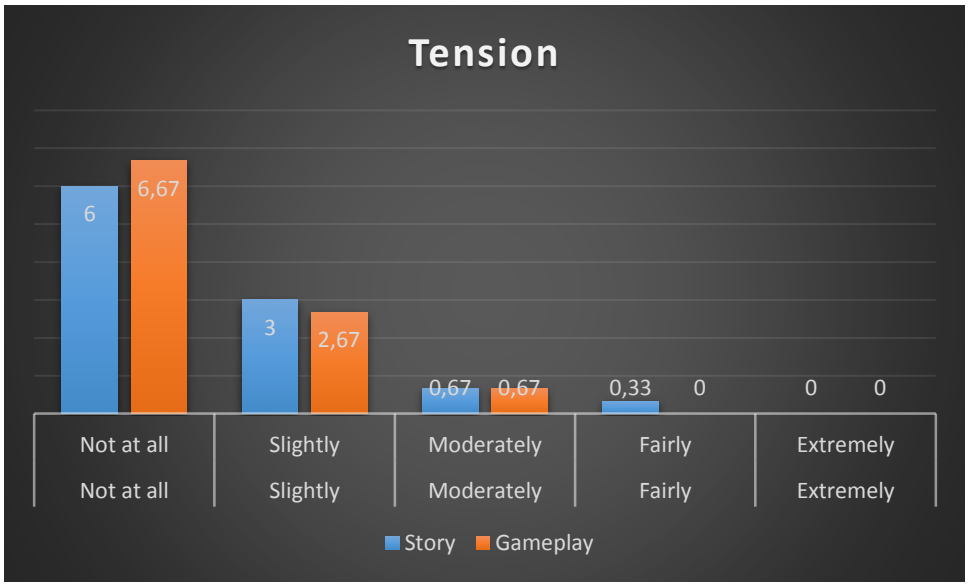

Figure 10: Data for tension

9.3.6 CHALLENGE

Present in the Challenge component are five questions like: "I thought it was hard" and "I had to put a lot of effort into it". Challenge is used to gauge how difficult players thought the game was, how much energy they had to put into the game's tasks in order to complete them. Figure 11 implies that very few players in this test group found the games extremely challenging, but more players in this group found the gameplay version fairly challenging over the story version.

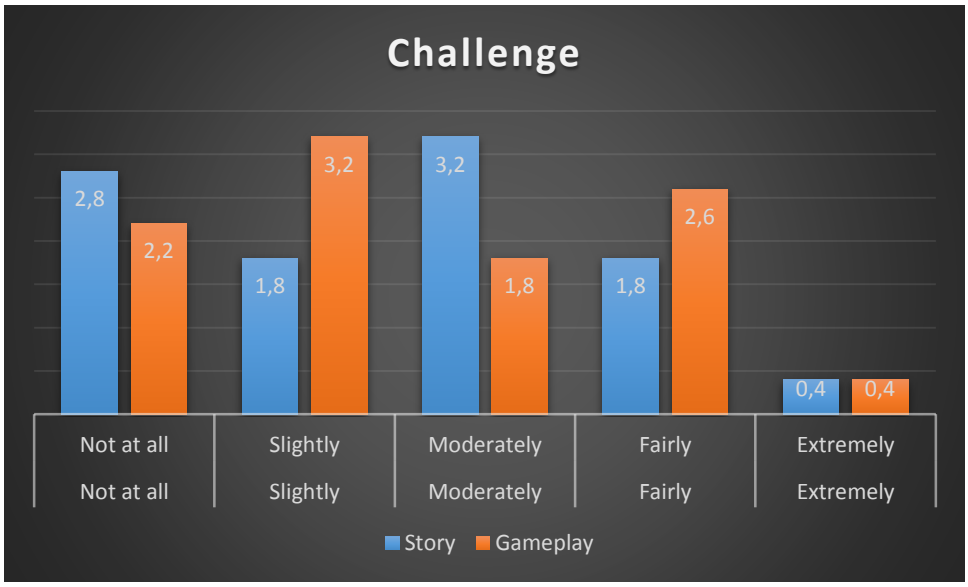

Figure 11: Data for Challenge

9.4 IN ESSENCE

This paragraph answers the second research question: *"What are the reactions of the players, referring to the Game Experience Questionnaire, on the two different versions of the game?"*
The GEQ data shows that, in general, this group of players seemed more immersed when playing the story version, opposed to the gameplay version; the data also suggested that this group of players were more in a state of flow when playing the story version, even though the story version seemed to have less positive affect and more negative affect on these players' experiences over the gameplay version. The data for the story version implies that it provided slightly more tension than the gameplay version and a lot of the players from this test group found both games moderately to fairly challenging, the gameplay version seems to bring more challenge than the story version. The set of data for the challenge component is striking, since it is the one component where answers were expected to remain fairly equal, yet differ the most, compared to the data for the other components.

10. CONCLUSIONS

In this chapter conclusions will be derived from the results.

10.1 IMMERSION AND FLOW

From the results it may be deducted that this group of players seemed more immersed when playing the story version; the data also suggested that this group of players were more in a state of flow when playing the story version. It could be concluded that this indicates that the testers felt more present and invested in the story version of the game. This outcome is in accordance with the initial hypothesis, which stated that the story version of the game might improve the player experience on five of the six tested components, immersion and flow being two of those five components. The reason behind the slightly higher scores in immersion and flow for the story version could be the recognizable elements in the story version; aesthetic elements which can be instilled with meaning as opposed to the abstract visuals of the gameplay version.

10.2 POSITIVE AND NEGATIVE AFFECT & TENSION

The results suggest that this group of players seemed to have had more of a positive experience with the gameplay version over the story version; this is also substantiated by the story version scoring higher in the negative affect component and slightly higher in the tension component, which implies that the testers felt more negatively toward the story version. This outcome proposes that this group of players felt tenser and in less of a positive mood while playing the story version, opposed to the gameplay version. This data contradicts the initial hypothesis, which stated that the story version of the game might improve the player experience on five of the six tested components, positive affect, negative affect and tension being three of those five components. The explanation for this outcome may be the heavy content of the story and the sombre atmosphere portrayed through the aesthetic elements of the story version of the game.

10.3 CHALLENGE

The results gathered for the challenge component entail something unexpected. The one component that was expected to be mostly equal in scores for both the story and the gameplay version, seemed to end up getting the most differing opinions from the testers in this group. The gameplay version seems to have an edge in the “fairly” option, which is the highest option with a difference in the scores between the story and gameplay versions. From that it can be concluded that the players in this group found the gameplay version more difficult, but the story version scores higher in the “moderately” option, which suggests that the testers who picked that option thought that the story version was slightly more challenging than the gameplay version. The data from the GEQ for the challenge component completely opposes the initial hypothesis, which said that of the six tested components, the challenge component might not differ between the story and gameplay version, since it is based on the mechanics that remain exactly the same in both versions.

10.4 IN CONCLUSION

Finally, it can be concluded that through testing with this particular group of people and the six of seven components used from the Game Experience Questionnaire; most of the hypothesis seemed to be inaccurate. To be more specific, the thoughts about the story version improving the immersion and flow components of the players’ experiences seemed to be correct with this group of players, but the thoughts about the positive affect, negative affect and tension components improving turned out to be faulty, as suggested by the data gathered from this group of players. The challenge component ended up not being equal in both version of the game either.

It can be concluded, looking back at the main problem for this research, which was one of knowledge; “does story affect the player experience?” that after the tests and data analysis, for this test group, story does indeed affect the player experience. The goal of collecting information for this problem has therefore been reached.”

11. DISCUSSION

The conclusions will be discussed in this chapter.

11.1 IMMERSION AND FLOW

The addition of a character in the story version, as suggested by Chatman in his diagram from his book Story and Discourse (1978) might have given players something recognizable to connect with, thus allowing them to feel more immersed in the experience. The air of mystery and the openness of interpretation in the first sections of the story may also work as an attractive aspect for players to get more immersed in the game. Focusing on the story might have gotten the testers to concentrate more on the game, adding to the flow component.

Another interesting aspect in the immersion and flow components is that the gameplay version also has a score above zero, which implies that there are also elements present in that version which might induce immersion and flow. Singling out and perfecting those elements may form an entirely new research that could propel games with and without story forward, since it would merely rely on gameplay, an element that ought to be present in most every game.

11.2 POSITIVE AFFECT AND NEGATIVE AFFECT & TENSION

The slower, sombre soundtrack of the story version is the exact opposite of the cheerier, energetic soundtrack of the gameplay version; next to that, the story version handles quite a heavy theme (war and death). Correlation between these elements in the story version and the exact opposite in the gameplay version might explain the more negative feelings that the group of players who played the story version experienced. Though construction of both versions of the game was done carefully, the impact of the different soundtracks in both versions had not been accounted for in the hypothesis.

Audio is another subject that may still not be used to its full potential in most games today. The effects of the games' soundtrack may have seeped into the data, even in this small scale test. Imagination might present one with an idea of the effect audio would have on the data if it was focused on more during the creation of the two versions of the game. Ironically, audio may be the unsung hero of gaming, really making an experience all encompassing, since humans are audiovisual beings after all, not merely slaves to their eyes.

11.3 CHALLENGE

A data sample of a much larger and less diverse test group would have probably given more substantiated results, but as it stands now, challenge is the component with the most diversified scores out of all six components. With the gameplay being the exact same in both versions of the game, this occurrence was completely unexpected, since the challenge component is mostly ruled by the difficulty of the tasks at hand, which does not differ from the gameplay to the story version. The inequality of the scores seems to be caused by something other than gameplay, this could be, as mentioned, the diversity of the test group, but it may also be because of the different feel of both games, maybe even a combination of both the diversity and the feel. The story version has a sombre, slower feel to it, while the gameplay version has a more energetic, upbeat feel to it, with flashy visuals and a faster soundtrack. This feeling alone may be what gives players a mentally different attitude toward the same task. Attempting to alter the difference in challenge for a particular task by merely changing the atmosphere around the task, instead of the task itself would also make for an interesting research topic, one that stretches far beyond the subject area of gaming.

11.4 THE TESTS AND FUTURE ENDEAVOURS

What needs to be mentioned in regards to the Game Experience Questionnaire, especially for the immersion and flow components, is that data may fall short, due to the GEQ being exactly that, a questionnaire, a list of questions that testers need to fill in for themselves, after they played the game. In medias res observation was not used, so any signs of immersion and flow or lack thereof has therefore not been observed. Due to the lack of time for testing and the geographical dispersion of test subjects,

observation was not an option for all tests, and thus was not used. It is though, something to keep in mind for future tests, as observation may uncover subtleties in player behaviour that a questionnaire cannot.

To touch on another discussion point regarding the target audience; the GEQ was presented to the players in English. Most players (being Dutch) were not fluent in English. As the test guide, I stood at the ready to answer any questions the testers had, even if it was as arbitrary as explaining the meaning of a word. A note for following tests is to try and prepare questionnaires in the native language of the target audience, if at all possible. This makes it easier for the testers and may assure more accurate results.

To get back to the original research topic; looking back at the tests and data, it seems that story does indeed have an effect on the player's experience. It may not always be a positive effect, but then again, an experience does not always have to be positive to be good. Putting a story into a game can be quite a lot more work, I can state this now, after first-hand experience. It being worth the work, will most likely depend on the wishes of both the target audience and the creator. Engaging a player in a story through the medium of games might unlock the possibility of deeper immersion, higher levels of flow and even emotional engagement, but if you're after a fast and fun experience, none of these things may even matter to you. If so, keep in mind that games are able to stand alone and do not require a story element as a necessity to function. I personally do believe that a good story does add to a player's experience though, and even with all the added work of crafting a story and creating the extra assets necessary to convey that story to the player, it may very well be worth it if players' experiences are improved.

If I were to indulge myself further into the subject area of story in games, I would enjoy exploring the ways of intertwining story and gameplay, blurring the lines between the two subjects that are so often discussed in separately. Going deeper into this research may also provide interesting data; even trying out different stories to create different feelings and emotional experiences, while the gameplay stays the same would also interest me. There is so much left to discover.

In my opinion, gaming still has quite a way to go before reaching its peak as a medium that stands on its own feet, but it has come amazingly far and I will enjoy seeing it go even further; maybe being a part of the process myself. If you can't explore the world, uncover mysteries closer to home.

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APPENDICES

SCREENSHOTS OF THE TWO VERSIONS

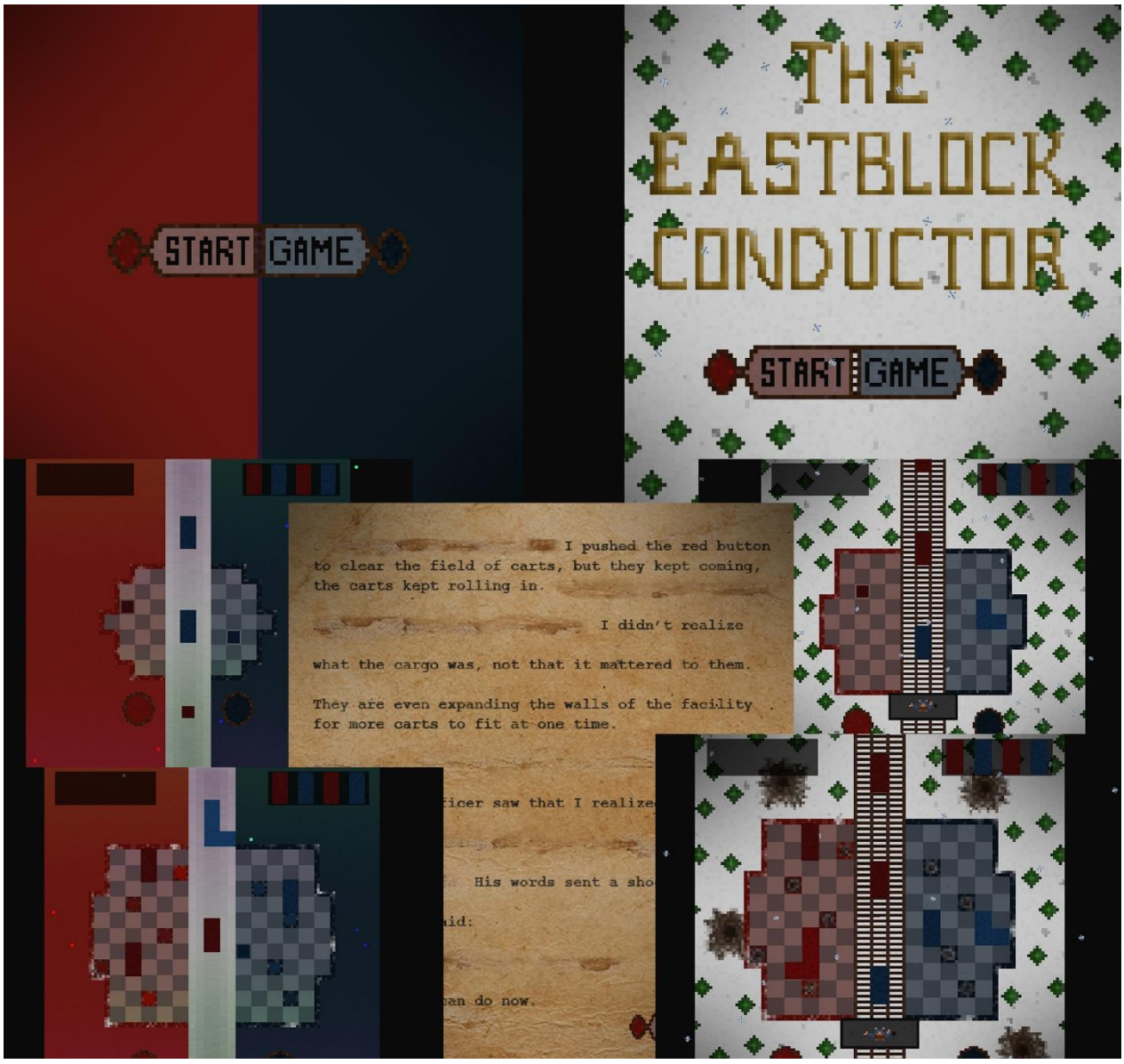

Figure 12: Composition of screenshots of both versions of the game

Game Experience Questionnaire – Core Module

Please indicate how you felt while playing the game for each of the items, on the following scale:

not at all	slightly	moderately	fairly	extremely
0	1	2	3	4
< >	< >	< >	< >	< >

1	I felt content
2	I felt skilful
3	I was interested in the game's story
4	I thought it was fun
5	I was fully occupied with the game
6	I felt happy
7	It gave me a bad mood
8	I thought about other things
9	I found it tiresome
10	I felt competent
11	I thought it was hard
12	It was aesthetically pleasing
13	I forgot everything around me
14	I felt good
15	I was good at it
16	I felt bored
17	I felt successful
18	I felt imaginative
19	I felt that I could explore things
20	I enjoyed it
21	I was fast at reaching the game's targets
22	I felt annoyed
23	I felt pressured
24	I felt irritable
25	I lost track of time
26	I felt challenged
27	I found it impressive

28 I was deeply concentrated in the game

29 I felt frustrated

30 It felt like a rich experience

31 I lost connection with the outside world

32 I felt time pressure

33 I had to put a lot of effort into it