

Explore using digital game and empathy as tools for self-expression

An Art Exhibition of Digital Game

By

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A thesis exhibition presented to OCAD University in partial fulfillment of the requirements for the degree of Master of Fine Arts in Digital Futures Program

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Abstract

For this thesis, the researcher proposes a unique angle that uses digital games as a tool for self-expression. Empathy theory will be applied to the game making process to help players understand the artist's expression. This process suggests that there is a potential for game makers to understand, model and instantiate more resources on affective address and embody those into game content in a way that acknowledges and accommodates the player's processes of emotional cognition.

The practical project associated with the thesis is an experimental game that communicates to the players the emotions and life experiences that the game artist is willing to express. The anticipated result, the images, music, interaction and story are crafted in order to tell a single story, but the game experience should remind players about their own memories, experiences and special stories outside the game.

Key Words:

game studies, emotion, empathy, personal narrative, interaction, connection between game and player, emotional experience, culture specificity, and memory

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Table of Contents

1. INTRODUCTION	1
1.1 MOTIVATION:	2
1.2 VIDEOGAMES AS ART	3
1.3 EMOTIONAL ELICITATION OF VIDEO GAME	6
1.4 INSPIRATION.....	8
2. FOUNDATION:	10
2.1 EMPATHY:	10
2.2 GAME STRUCTURE:	15
3. THE GAME PROJECT:.....	24
3.1 PROJECT OVERVIEW:	24
3.2 GAME DEVELOPMENT PROCEDURE	25
3.2.1 PRE-PRODUCTION—PLAN	25
3.2.2 PRODUCTION—CONCEPT TO DIGITAL.....	28
3.2.3 ITERATION AND RELEASE	31
3.3 GAME NARRATIVE	31
3.4 APPLYING EMPATHY THEORY TO THE GAME NARRATIVE.....	33
3.5 GAME WORLD.....	34
3.6 GAME RULES:	43
3.7 PLAYER	49
3.8 EMOTIONAL RESPONSE TESTS AND RESEARCH.....	52
4. CONCLUSION	55
REFERENCES.....	56
APPENDIX A: GAME DESIGN DOCUMENT	59
APPENDIX B: GAME DESIGN PROCESS WORK.....	63

List of Figures

FIGURE 1: PAC-MAN	4
FIGURE 2: TETRIS	4
FIGURE 3: PAINTINGS BY JACKSON POLLOCK AND LUCIO FONTANA	12
FIGURE 4: FLOW ZONE.....	20
FIGURE 5: EXPENDED FLOW ZONE.....	21
FIGURE 6: FALLOUT: NEW VEGAS	22
FIGURE 7: FLOW GAME BY JEVONA CHEN	23
FIGURE 8: EXHIBITION SETTINGS	24
FIGURE 9: SKETCHED CONCEPT ART BACKGROUND	27
FIGURE 10: SKETCHED FULL LEVEL CONCEPT ART	27
FIGURE 11: THE 3D LEVEL.....	28
FIGURE 12: CHARACTER PRODUCTION.....	29
FIGURE 13: A LEVEL BEFORE AND AFTER LIGHTING	30
FIGURE 14: DESIGN PROCESS OF THE GIRL	36
FIGURE 15: PHOTOS OF MY CHILDHOOD.....	37
FIGURE 16: THE SUN.....	38
FIGURE 17: SUN IN HIS OLD AGE	38
FIGURE 18: GEOMETRIC FOREGROUND	40
FIGURE 19: THE OLD BACKYARD	41
FIGURE 20: CONCEPT ART OF THE SECOND LEVEL.....	42
FIGURE 21: CONCEPT ART OF THE THIRD LEVEL.....	43

FIGURE 22: THE FALLING DOWN ANIMATION	48
FIGURE 23: CHUNK-BASED LEVEL DESIGN	51
FIGURE 24: THE PULSE SENSOR	53
FIGURE 25: GAME FEEDBACK	54
FIGURE 26: GAME DESIGN SKETCH	61
FIGURE 27: DEVELOPMENT SCHEDULE.....	62
FIGURE 28: MAKING OF THE BABY GIRL CHARACTER.....	63
FIGURE 29: NORMAL ADJUSTMENT OF THE GIRL CHARACTER IN SECOND LEVEL.....	63
FIGURE 30: PROCESS OF CREATING THE FIRST LEVEL	64
FIGURE 31: MOOD BOARD OF THE SECOND LEVEL.....	64
FIGURE 32: DEVELOPMENT OF THE THIRD LEVEL.....	65

1. Introduction

As an artist who highly values her family but has to face the contradiction between family and career, the goal of this thesis is to express my sad emotions and powerless feelings regarding dying family members via a digital game. This paper explores how I use game design research on empathy as tools for self-expression to broaden the range of approaches to digital game making.

The thesis is developed in three parts. The thesis introduction describes my background and motivation to explain why I chose digital games as a form to express myself together with the meaning of digital games as an art form for self-expression within game culture. The foundation presents current research related to digital game structures, digital games as narrative architecture, empathy theory for art and narrative, principles of using empathy in game design to foster emotion and how these theories support further development of both this thesis and the thesis digital game project by building narrative and approaching empathy in players. The foundation also reviews the theory of the ways in which digital games generate emotions and uses flow theory (Csikszentmihalyi, 1990) to help players focus on the main emotions expressed by the game narrative. The third part applies the theory and principles reviewed in the foundation to the self-expression game process — outlining the game concept to include story and environmental setup, game rules and gameplay.

1.1 Motivation:

The theme that I express in my game is inspired by the tension between my family, career and limited time in my life. Study abroad is a valuable and important experience, which not only enhances my academic career but also enriches my life experience. The new and better living conditions give me more time and freedom to think about my far away family than when I still struggled with life financially and emotionally. The distance between my family and I keeps reminding me of the importance of the “TuanYuan” (family get together) in Chinese culture. In Chinese tradition, it is generally considered that in order to have a happy life, a girl should live in the place where she has grown up and is surrounded by her family and old friends. In part, this is so she can take care of her family when the family becomes elderly. The fragility of life and the limits of time do bring strong sorrow to my own inner world, as I cannot be with my family when they are sick. I want to remind people of the shortness of life, that people should value time and put aside some time to be together with their family so that they will not feel regretful when family members have passed. The contradiction of career, better living conditions, happy moments with family and limited energy and time is always a complex social issue, especially in China. Because China is a developing country, only a few large cities have more job opportunities. Large amounts of young adults like me leave their hometowns to study or work. Moreover, this issue is not limited to young adults. Parents love to keep their offspring with them, but also want them to pursue a better life and enriching experiences. In order to express this issue, considering my game making and interactive media background, digital games are a medium and an art form that seem

natural for me to experiment with.

Digital games have their unique aspects when addressing the tensions of young adults. Because digital games have the potential to build an open fantasy background with loose eras and social settings this might allow more players to project themselves onto the experience and that put players in a participative perspective that allows the player to become really involved in the game, their action even can change the direction of the game.

1.2 Videogames as art

Are videogames art? This question has been a subject of debate for a long time. Originally commercial toys, videogames began to emerge as an art form. (Stalker, 2005) Professor Celia Pearce identified one original art games in a small wave in the early 1980s with games such as Bernie DeKoven and Jaron Lanier's Alien Garden (1982) (Charles, 2010). One of the first times that videogames were displayed in an art museum was an exhibition called "Beyond Interface" at the Walker Art Center in 1989. A number of similar exhibitions followed at other institutions. Nevertheless, videogames were still not commonly accepted as an art form. For example, Jack Kroll argued that "games can be fun and rewarding in many ways, but they can't transmit the emotional complexity that is the root of art" (Kroll, 2000). His position received extensive negative replies from game industry magazine journalists and web writers, which showed that he touched a nerve. Eventually, many other scholars came to think of gaming as an art form (Smuts,

2005) with potential to achieve emotion and culture complexity (Jenkins, 2000). More recently, MoMA — The Museum of Modern Art — announced that 14 video games including Pac-Man (Figure 1), Tetris (Figure 2) and SimCity, will become part of its permanent exhibition and that the collection will be expanded to forty games in time.



Figure 1: Pac-Man



Figure 2: Tetris

Tiffany Holmes defined art games in 2003 as: “an interactive work with visual art value that also challenges cultural stereotypes, offers meaningful social or historical critique or tells a story in a novel manner” (Holmes 2003). Stalker defined the art game to be primarily as a new mode for structuring narrative and culture critique (Stalker 2005). Stalker’s definition of art games appeals to me because I am interested in using digital games to build personal narratives. Jenkins also supported the importance of videogames as tools for structuring narrative.

“Narrative analysis need not be prescriptive, even if some narratologist - Janet Murray is the most oft cited example - do seem to be advocating for games to pursue particular narrative forms. There is not one future of games. The goal should be to foster diversification of genres, aesthetics, and audiences, to open gamers to the broadest possible range of experiences.” (Jenkins, 2004)

Traditionally videogames were considered as play or just for fun. However, since the emotion I want to express in my game is pain, rather than fun or entertainment, Holmes’ and Stalker’s art game definitions show that I could use my digital game making to express sorrow and tension through narrative.

It has been almost 50 years since the birth of the first home videogame in 1972, the Magnavox Odyssey, which worked on a standard television. After the golden age of arcade machines in 1970s, the second-generation and third generation consoles such as the Nintendo Entertainment system gained in popularity in North America and Japan (Consalvo, 2006). As a result of technological developments and the Internet boom, both the forms of, and the audiences for, videogames became more diverse. For example, there

are both hardcore game lovers as well as casual players looking for a distraction from the stresses of daily life. Motion game console and sensors like Wii, Kinect and PS Move bring more physically interactive possibilities for a family playing together and have been shown to attract more female players. For example, according to the Video Gamer Segmentation survey carried out by NDP.com, the percentage of female console players grew from 23 to 28 percent in 2009, as rise that can be mainly attributed to the Wii, which itself saw a 19 percent increase in usage from 2008 to 2009. Online distribution methods and more easy-to-use game development tools, furthermore, contributed to the independent videogame revolution that happened in 2000s. Some indie games, such as World of Goo (2008) and Minecraft (2009), were built by small teams of one or two persons, received significant financial success and contributed to the diversity of the digital game form thanks to their strong art aesthetics, innovative gameplay and highly refined game experiences. Their success attracted more people to join the indie game community, which led to an exploding DIY game culture and contributed to a more diversified game audience seeking interesting ideas and unique experiences. My game, therefore, is targeted at an already diversified videogame audience.

1.3 Emotional elicitation of video game

Compared with traditional storytelling, that describes events (Jenkins, 2005), my game focuses on emotional experiences through a linear gameplay process that reflects peoples' linear life experience (i.e. people cannot go back to past ages and times). During

the process of playing my game, players can use their imagination to project themselves onto the game characters and the game narrative. For me, the emotions embodied within the game are triggered by the sorrow and regret of leaving my beloved family members. These are different from traditional emotions of videogames such as anxiety and anger. The discussion of emotional elicitation is not limited to independent art games but is also popular and important in the mainstream game industry and will influence the future development of the video game culture. “Almost all videogame scholars are interested in videogame’s ability to generate emotions. Developers want to make videogames that make people cry, educators want to engage students in learning, and psychologists want to understand people’s motivations to play.” (Frome, 2007)

I hope that my game contributes to the ongoing diversification of the game industry by building emotional diversity in a specific game project. The importance of emotions in digital games has been acknowledged by the game industry, game culture and even society more generally. As Jenova Chen, the developer of *Journey* (2012), said, “the goal was to create a game where people felt they are connected with each other, to show the positive side of humanity in them” (Chen 2012). Chen is an independent game designer who values positive emotion in his games. The ongoing critical and commercial success of his games helps to prove his point. *Journey*, for example, is a videogame released on Play Station 3 that is primarily intended to arouse positive emotions in the players, rather than to be a challenging and ‘fun’ game. In an interview called “A personal Journey: Jenova Chen’s goals for games” by Ed Smith (2012), Jenova complains about the current game industry, saying there is not enough positive emotions

in games for adults. He argues that the competitive nature of games and the scoring system that is common in current games makes the interaction between players less human because it focuses players on the score rather than each other. Jenova wanted to create a game that enhanced the awareness of people's connection to each other. For example, in Journey, there is no competitive element and players can only accompany each other during their journey. Emotional engagement and feelings are always key in Jenova's games, which are less about large-scale commercial games and more about how people subtly engage with their friends within the game.

As a work of personal expression, my game narrative is based on my own life experiences. My challenge of using digital game form is to make personal expression understood by the player. In videogames, the dramatic context and game narrative is interactive and hidden in the background waiting for players to discover. The art aspects such as game aesthetics, characters' appearances, animation and music all influence the player's experience and the emotional impact of the game. The goal of my research is how to express my personal emotion and narrative in a digital game so that the player could understand them and reflect on their own experience.

1.4 Inspiration

One of my research goals is to make players understand the narrative and the emotions embedded in my game. After researching a number of models of emotion, it seemed that the concept of empathy could be useful. According to Leiber and Anders,

“...empathy is the ability to perceive and understand other people's emotions and to react appropriately. This ability is a necessary prerequisite for successful interpersonal interaction” (Leiberg S, Anders S, 2006). The concept of empathy, therefore, could inform how players understand the emotions embedded in the game. My research into empathy theory and the application of empathic approaches to my game making process will be covered in Section Two and Three of this thesis.

2. Foundation:

The first goal of this thesis project is to successfully express my emotions in a videogame. The second goal is to make players understand the emotions expressed. These goals are a challenge, as emotions do not have a concrete shape. As noted in the Inspiration section of the Introduction, empathy is an important term to look into for its potential value to help direct the emotional expression in my game so that the player successfully understands it.

2.1 Empathy:

My art game features emotionally expressive narrative. Whether or not the player receives the emotional content is the big challenge. As a result, I used interdisciplinary methods to express my emotion through a digital game, including modeling empathy, narrative building and Dynamic Difficulty Adjustment system directed by the flow theory (Csikszentmihalyi, 2000) to generate the experiences of players from not only an emotional perspective but also a game player perspective. Empathy is an important scientific approach to my game making process to ensure players can receive my emotion expression. What is empathy and what makes it a scientific approach? Empathy is an experience, of sharing and understanding the momentary psychological state of another person (Schafer, 1959). Also, it can be seen as a complex form of psychological inference in which observation, memory, knowledge, and reasoning are combined and recorded to

yield insights into the thoughts and feelings of others (Lockes, 1997). The key concepts of empathy are: understanding others' emotions and feelings; using memory and experiences as resources; and sharing emotional states to others.

Empathy theory in art is an essential aspect of my art game. For example, my artistic approach to drawing environmental elements such as the background and landscape as well as creating the animation was designed to increase or enhance empathic emotional expression. Freedlger and Gallese (2007) address how empathy can be achieved in the visual arts. It is achieved in multiple ways. For example, physical empathy increases in response to unbalanced bodies in art works because they cause the viewer to have similar feelings of imbalance themselves.

Furthermore, physical empathy easily transmutes into a feeling of empathy for the emotional consequences of the ways in which the body is damaged or mutilated. Even when the image contains no overt emotional component, a sense of bodily resonance can arise. These are all instances in which beholders might find themselves automatically simulating the emotional expression, the movement or even the implied movement within the representation. (Freedlger and Gallese, 2007)

Visual art experiences, therefore, can increase physical empathy when the audience observes unbalanced body parts in artworks. Physical empathy, in turn, causes emotional responses and feelings in audience's brains. I applied this theory to game character animation creation so that the character's movements and pain might increase the experience of physical empathy in the players. In addition to unbalanced bodies, simulation also occurs in the experience of abstract paintings such as those by Jackson Pollock (Figure 3a) and Lucio Fontana (Figure 3b), viewers often experience a sense of

bodily involvement with the movements that are implied by the physical traces and a sense of empathetic movement that seems to coincide with the gesture felt to have produced the physical empathy (Freedlger and Gallese, 2007). When players feel involvement with the movement of the characters, and the character animations are decided by the interactive performance of the players the player feels an empathetic response. For example, in the third level of my game, if the player does not successfully control the girl to jump over the barrier, the girl and the sun will fall down (more description of the game mechanics will be conducted in the Game Character Section): when players control the characters and see the animation, they will feel the involvement with the animation. When their actions lead to the falling down animation, the emotion and physical feelings are simulated. Together with this involvement, players will have strong empathy with the animation, as well as a relationship between the game and the characters. In this way, the aesthetic experience together with the control mechanics uniquely fosters the player's empathy.

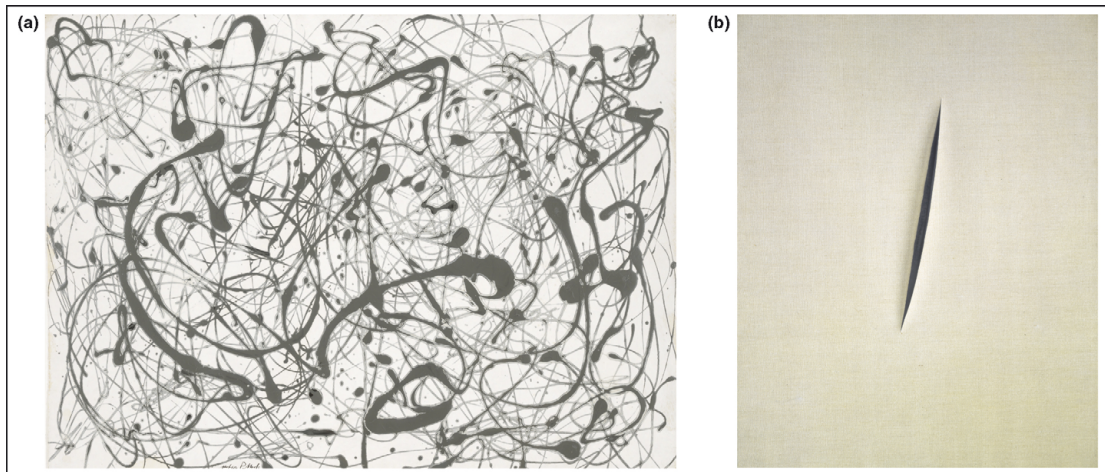


Figure 3: Paintings by Jackson Pollock and Lucio Fontana

In addition to visual art, narrative, interactive experiences and rules are also important aspects of a game: they all help create empathy. Based on characteristics of empathy, game studies scholars Jonathan Belman and Mary Flanagan (2007) developed four principles to design games that foster empathy. They began their research with an overview of previous research into the subject of empathy, focusing on the field of psychology, but also including practical case studies of current digital games. I used these four principles to design the rules and construct the narrative for my empathic game. The following paragraphs will introduce these concepts; additional information about how they were applied to my creative process will be provided in the third chapter of this thesis.

The first principle is that players are likely to empathize only when they make an intentional effort to do so as the game begins. This principle is adapted from Stephan's and Finlay's (1999) research about creating empathy in intergroup relations. For example, when people do not know about the pain of a drug-addicted group, they will not feel empathy when they meet the group. But if they are told about the hard life of the drug-addicted group beforehand, they will feel more empathy. In my game, at the beginning, the players need to empathize with the little girl so that they have the motivation to protect her. The girl character is fragile and cute, so players would naturally want to protect her without further contextualization. I also applied this principle to build the theme of the game narrative and the character appearance design, which I will describe in more detail in the Game Character and Game Narrative of the Project section.

The second principle is to give players specific recommendations about how their

actions can address the issues represented in the game. This principle is developed based on the theory that if one does not know how to help the other person, the pain caused by empathy will have no obvious remedy. Since the goal of my game is to make the player empathize with my pain, this principle is applied throughout the game. For example, in the third level the player knows what to do to extend their stay with the sun, so when they perform badly, they feel the pain of losing a beloved person.

The third principle is that a short burst of emotional empathy works well if desired outcomes do not require significant shifts in the players' beliefs about themselves, the world, or themselves in relation to the world. This principle could help with the creation of the story of the game. For instance, the main belief of the story should follow the mainstream value in the world. On the contrary, if my game asks the players to harm their family members, the players probably would not emotionally empathize with the game narratives. In my game, players need to empathize with the love and care between family, which is always the mainstream value in most countries and areas.

The last principle is that the game should emphasize points of similarity between the player and people or groups with whom she is supposed to empathize. It suggests that people will not empathize with the groups that are far away from their lives. When applied to the characters in my game that represent my family and myself, these characters should be easy for players to identify with. For example, I am represented by a cute baby girl dressed in pink whom people will find familiar and want to protect.

2.2 Game structure:

The empathy theories described above direct the decision making of game elements such as gameplay, game characters and game rules. Those elements need to be built on an expressive structure to ensure that I am able successfully express myself in a digital game.

But the experience of playing games can never be simply reduced to the experience of a story. Many other factors, which have little or nothing to do with storytelling, contribute to the development of a great game (Jenkins, 2002). Before it is possible to create a game that fosters empathy, the structure of a digital game needs to be broken down in order to apply specific empathic approaches to every single element that builds the body of the digital game. In the following paragraphs, a digital game will be considered as combining a game world, game rules and game players.

A game takes the players away to an imaginary place—a game world. A game world is an artificial universe built with imagination where the game narrative happens. Most videogames present their game world with pictures and sound: art, animation, music and audio effect (Adams, 2010). The pictures and sound form the game world so the game world can express its narrative. Videogames do not simply tell stories; they act as a type of “narrative architecture” (Jenkins, 2004) that embeds narratives into game elements. Those elements present the world expressed in the game story, character and game space. Characters and the motivation of the characters drive the events of the narrative, which in turn allow players to experience the game world. In order to build a narratively compelling world for the players, “environmental storytelling” (Jenkins, 2004)

techniques could provide conceptual tools. Disney uses “environmental storytelling” techniques to build amusement park attractions. "The amusement park attraction doesn't so much reproduce the story of a literary work, such as *The Wind in the Willows*, as it evokes its atmosphere; the original story provides" (Jenkins, 2004).

Similar to the environmental elements in the amusement park, the game environment also needs to evoke the game atmosphere. For example, if the game narrative is expressing a happy and relaxed emotion, the game world should reinforce the positive and happy concept by using vivid color, music with crisp rhythm and even the architectures in the game world should be new rather than old and damaged. Compared with the traditional linear notions of narrative, the digital game narratives are conducted through the game environments. For example, in novels or films, the narratives appear in the front by dialogues and straight descriptions; the environmental narratives only serve small percentages of narrative building functions. (Jenkins, 2004) However, in digital games, the front-end narratives are replaced by interaction, which could only wait for discovery by the players through the play process. As a result, the environmental storytelling becomes deeply essential for narrative building in digital games.

Game spaces are filled with information and “palace(s) of memory” (Jenkins, 2004) that build the game narratives (Jenkins, 2004). My game world is largely fantasy and this gives me freedom to put my memory into my game. For example, the guardian of the girl, the representation of me, is a sun rather than a real person and the sun represents my family who nurtured me and gave me warmth. I could also put things I was afraid of into the game world without considering if it made sense in reality, such as huge

spiders chasing the girl. Here is how narrative empathy happens in the game world: when players encounter memory elements such as spiders, they remember being in similar situations and are reminded of the emotion they experienced then. Similarly, when players witness the sun's leaving, they experience the strong feelings of loss based on their own emotional experiences.

Even when a videogame successfully builds narrative, how does the narrative create empathy in the players? In order to fill the gap, how narrative generates empathy needs to be discussed here. Engaging with narrative is an empathetic act (Oatley, 2012). It involves entering a simulated world, and inserting characters' goals and plans into the processes that we usually use to make and carry out our plans in the world.

“It has two parts. First, we set aside our own plans and concerns for a while as we take up a book; we then take on the plans and concerns of a fictional character and empathetically imagine what that character might feel: we are not just book reading, we are emotion-reading. Second, we experience emotions — our own emotions — in the circumstances of a character's concerns, plans and actions” (Oatley, 2012).

Narrative empathy theory describes what happens after players enter a game world. As long as the game world has similar social values to the players (Belman and Flanagan, 2007), it is easier for players to project themselves onto the game character and empathetically imagine what the character might feel. Third, the narrative will remind players about their emotions in certain situations that are similar with that of the game character. So the narrative built by the resources from my memory does have potential to remind players about their memory.

But a well-shaped game world could, at most, make the digital game a digital

amusement park. A core structural aspect of games is rules. This is perhaps the most prominent feature of games that distinguishes them from other forms of media, art, and entertainment (Salen & Zimmerman, 2004). The rules define what players can and cannot do to achieve the goal of the game. Rules, in this sense, define the activities players adopt in order to play, and the guidelines they obey to make the game move forward (Suits, 1978).

In my game, in order to empathize with the game narratives, players need to finish the whole game process to understand all the emotions and experiences that I expressed in the game. Rules are the driver to motivate the players to complete the emotional journey. In my game the setting of individual rules needs to fit into the empathy game principles listed in the empathy theory foundation section, so the rules will enhance the narratives by leading the players and deeply linking them to the game characters more deeply. The details with building empathic rules will be introduced in chapter 3.

Game rules link the players together with the game world by regulating how players can interact with the game world. (Adams, 2010) So, another essential part that needs to be taken into account is the game player.

"Begin like this: If photographs are images, and films are moving images, then videogames are actions... Without the active participation of players and machines, videogames exist only as static computer code. Videogames come into being when the machine is powered up and the software is executed; they exist when enacted. (Galloway: 2006)"

According to Galloway, it is the game players that make the games exist. The goal of this thesis is to create a digital game for self-expression. Therefore, the players, as the

receivers of those expressions, make those expressions meaningful.

Players' emotions do not purely come from the narratives and events in the game world, but also come from the interaction between the players and the games. Frome (2007) discussed how emotions are generated by videogames. In Frome's view players play two key roles when they play a videogame. One role is that of an observer-participant who engages with the game but does not change the contents of the game. The observer-participants have freedom to understand the artwork with their mental activities such as constructing the stories and evaluating the characters based on the processes of cognition. The other key role of a player is actor-participant who does change the contents of a game. Within that role, the players' emotions are based primarily on what they do and how the game reacts to their behaviors. My game features personal narrative, therefore the rules and interactions can express personal narratives. But if the interaction is too difficult, this will lead to repetitive failures of casual players. Those failures will result in negative emotions such as frustration and anxiety.

In order to increase empathy with players, players need to finish the game process to experiences the entire life process of the game characters. Any frustrations and anxieties can lead players to give up playing in the middle of my game. Mihaly Csikszentmihalyi's (1997) flow theory has significantly contributed to game making by investigating what helps people maintain a flow zone — an emotional state in which people will feel comfortable. Based on Flow Theory, people get distracted when the tasks they are facing are too difficult for them to handle. On the other hand, people will lose interest and feel bored when the tasks are too easy. People will be more engaged when

they are emotionally within the flow state—a state of concentration or complete absorption with the activity at hand and the situation, a state in which people are so involved in an activity that nothing else seems to matter. Also he proved a model that could help people recognize and maintain the Flow Zone (Figure 4).

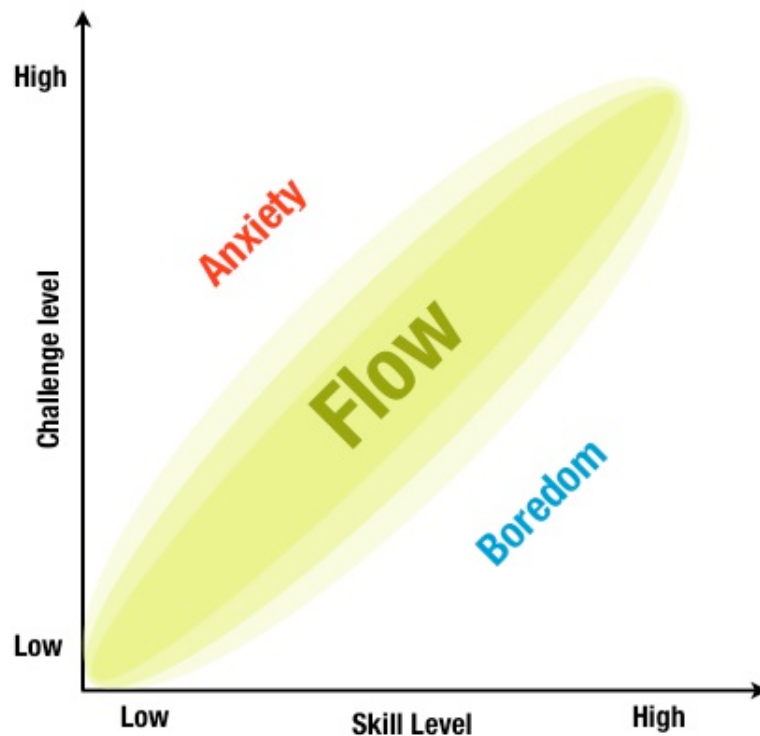


Figure 4: Flow Zone

4.5.1 Flow theory for game

In order to help the players concentrate on the game story and emotion within the game, players need to maintain their emotional state in what has been termed a 'flow zone' (Csikszentmihalyi, 1997). Which is to say that the game challenge level needs to match with players' skill level.

Jenova Chen, a successful independent game designer, developed

Csikszentmihalyi's flow theory from a gaming perspective and testing the theory for achieving flow through a game. One core element of Jenova's thesis is Dynamic Difficulty Adjustment — a game should change dynamically based on its player's skill and performance. Designing a game system where a wide range of players can get into flow is not difficult: 1. Expand your game's flow coverage by including a wide spectrum of gameplay with different difficulties. 2. Create a player-oriented active DDA system to allow different players to play in their own paces by expanding the flow zone (Chen, 2006). (Figure 5)

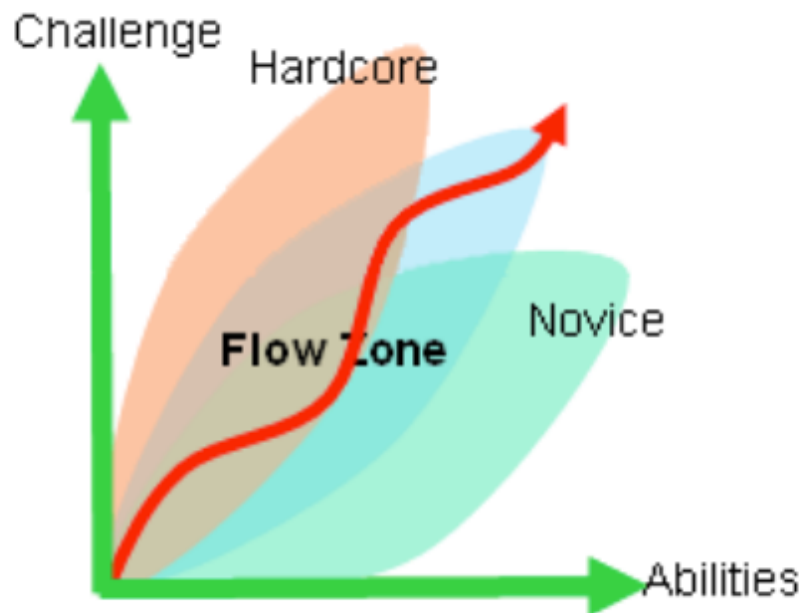


Figure 5: Expanded flow zone

Flow theory and its expanded game creation method provide a reliable solution — Dynamic Difficulty Adjustment (DDA) methods for my empathic self-expression game to avoid the difficulty of the game distracting players from the emotion I want them to empathize with. The game system could identify the players' flow zone and

automatically adjust the game difficulty for the players. As a result, the players are more likely to finish the entire game, as they neither feel anxious nor bored during the play experiences. This ensures players receive the full narrative in the game. As a result, the game can create stronger empathy. The DDA system has been applied to various game projects in different ways. How to build a DDA system for an empathetic art game will be carried out in the Player section of the third part of this thesis.

Fallout: New Vegas (2010) (Figure 6) is an action role-playing videogame that



Figure 6: Fallout: New Vegas

provides a bar for players to adjust the difficulty by themselves. But players will not get bonuses if they decrease the difficulty level. This system is still designed for the hard-core players who peruse fun experiences by achieving higher performance scores. So the system of Fallout is not suitable for my game, as my game is not targeting the hard-core game audience. But the system of Fallout is still a good example for the active Dynamic Difficulty Adjustment application in commercial games. Another iconic application of

active Dynamic Difficulty Adjustment is Jenova Chen's Flow (2006) (Figure 7), which is



Figure 7: Flow game by Jevona Chen

his Master's thesis project that applied Flow theory in gaming. Jenova mentioned in his thesis that the game should build mechanics that allow the players to choose the gameplay difficulty by themselves. This approach is less relevant to my game as its emphasis is on the subjective difficulty adjustment. My game includes a story, which has to be told in a linear way, but as mentioned earlier, the game narrative is shown by the game process and enhanced by the game world and game rules. So the rhythm of gameplay within a single level can be non-linear in order to achieve Dynamic Difficulty Adjustment. Unlike Jenova's active difficulty adjustment, here a passive difficulty adjustment method will be built in my game.

3. The game Project:

3.1 Project Overview:

The art game “Haven” is a single player 2.5D platform game built in the Unity3D game engine and controlled by a Wii controller. The game tells a story of the growing-up process of a girl and her guardian—a sun who sacrifices him to protect the girl. The game will be publicly exhibited in a dark and quiet space that allows the player to experience the story by playing the easy controlled digital game in relax environment. Figure 8 shows the settings of the game exhibition.



Figure 8: Exhibition Settings

3.2 Game development procedure

I collaborated with a game programmer Brent Mombourquette to make the game “Haven”, in order to maximize creativity and achieve all game ideas, Mombourquette is a fourth year undergraduate student in computer science major at University of Toronto. He did this game as an independent study course that is required by his department. He made an independent game with 3 undergraduate students in OCAD University in 2011, which gained him development experience with Unity 3D engine. I made a game called “Rescue Tom” in Unity3D in 2012. Both of us are familiar with this game engine and collaborative process of a team of members with interdisciplinary skills. Based on his experiences, we decided to use Dropbox as the storage of the project. We updated the Dropbox whenever we finish making new game assets such as 3D models and scripts.

3. 2. 1 Pre-production—Plan

Starting with my appreciation of my family, the game characters were set as a sun and a kid. Constrained by the production ability and time schedule, the game form was set as 2.5D platform game, so I could considered less about the 3D film language and 3D levels’ layout in order to have more time to produce 3D art assets with better quality. With the first discussion with Mombourquette, I expressed my research goal to him and some rough game ideas without detailed gameplay of different levels. He showed strong interests to this game as it explored ways to diversify the current digital game fields. In addition, based on his experience, he showed me some of his ideas regarding the

gameplay. I used to imagine that there would be camera transitions in different levels so this game was mainly a 2.5D game but with 3D puzzles. As I crafted the first game design document, Mombourquette did the first round technology test. After that, his feedback was that the camera transition was hard to achieve in a game controlled by a Wii controller. Moreover, the flawed transition between 2D and 3D would block players from a consistent game experience. Based on this feedback, I reworked the game design document. In this version, I carefully applied different empathy creation principles through the level settings and gameplays.

The artistic approach that I applied to enhance the pre-production was concept art. Concept art is necessary to videogames for planning. Instead of creating an underlying super structure, the concept art represents the necessary elements of the game world. It shows the distinct visual style of individual game. (Taylor, 2007) I sketched all the characters and levels out with color boards based on the old photos of my childhood. This step will be shown in a more detailed way in later sections such as Game World and Game Characters. As my game is a 2.5D game, most game assets need to be built into 3D models, the concept art creation process helped me with forecasting the visual style of the final 2.5D game. Taking the art creation process of the first level as an example, I visualize the game world with sketched 2D concept art to show the main illustrated visual style of the game including sketched environments, foreground, background, and color board (Figure 9). I could self-evaluate if the main visual style could help with the narratives. In addition, with the concept art within the game design document, the developer that collaborated with me could have a clear clue of the outcome of the game.

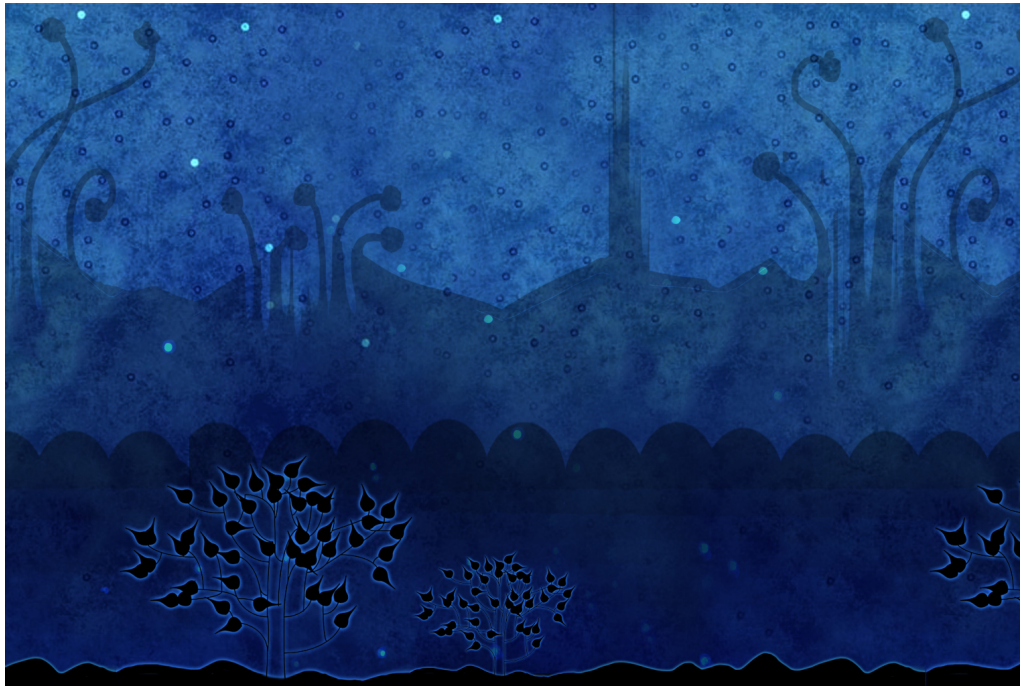


Figure 9: Sketched concept art background



Figure 10: Sketched full level concept art

After the second step that I added characters and special effects elements in the concept art image, it was clear to see that the newly add elements fit in the overall art style (Figure 10). So the 3D models created based on the concept art would compose an extract narrative space as planned (Figure 11). Additionally, the concept art works are real art artifacts that enhance the communication within the team, as team members easily understand visualized information during the development process.



Figure 11: The 3D level

3. 2. 2 Production—Concept to digital

During the production process, Mombourquette and me turned the concept idea to digital interactive game level by level. To start with I built placeholder 3D art assets in

Maya, such as using a ball as the placeholder for the sun character and using a cube as the placeholder of level platform. After I imported those placeholders into the Unity3D project and upload them into the Dropbox, Mombourquette started to work on the game interactive functions by applying scripts to those placeholders in the Unity3D. In the meantime, I started to build 3D models in Maya. There were two reasons for that I chose Maya as the 3D production tool. The first one is I learnt Maya for 3 years during my undergraduate education. During this research of creating an empathic digital game for self-expression, I did not need to spend extra time to learn this software. The other reason is that Unity3D is fully compatible with Maya project file. This allowed me import 3D assets into the game engine without special settings, which was high efficient. The art assets creation process of character included modeling, UV wrapping, texturing, rigging and animation (Figure 12). After finish one character, I imported the file into Unity3D by

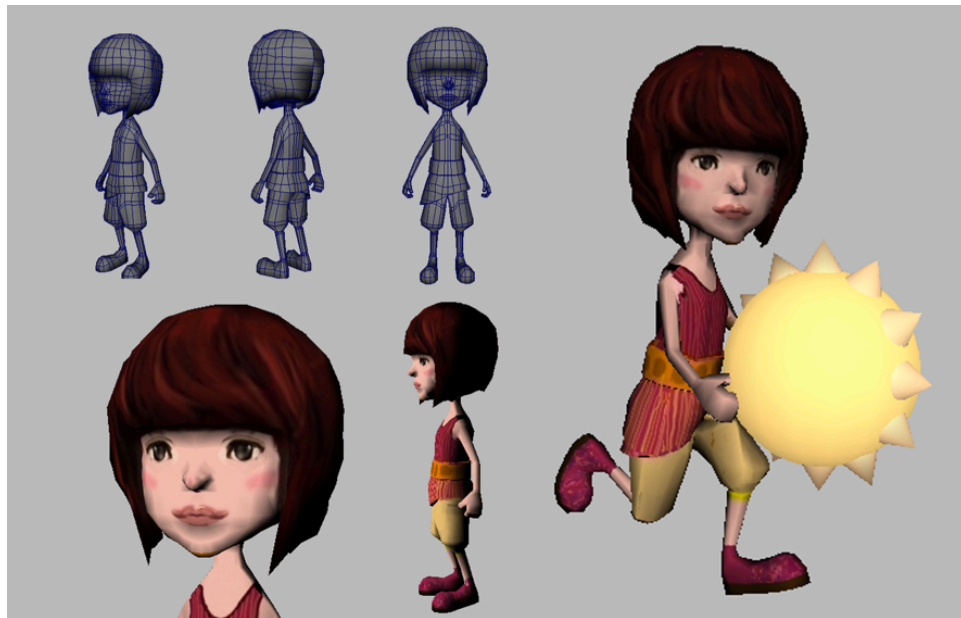


Figure 12: Character Production

telling the engine the specific frames of a certain animation clip and name those clips into “idle”, “run” and so on. So the game prototype at this stage allowed Mombourquette and me to have simple play test. Then in order to decide if the characters need more animation clips. The level assets creation was similar with the characters but without animation. After imported the entire environment assets, the lighting and color adjustment were conducted with Unity3D lighting system (Figure 13). More process images of different characters and levels creation are listed in the appendix B. The last steps were putting in special effects, sound effects and background music.

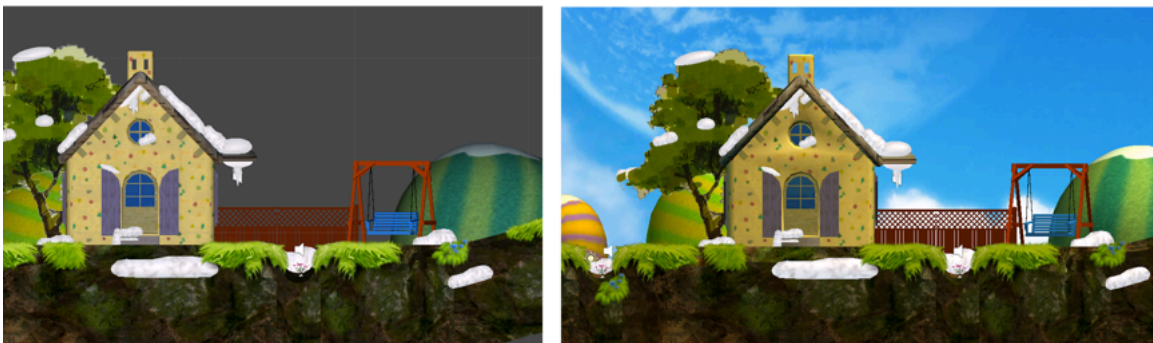


Figure 13: A level before and after lighting

Mombourquette coded with C# and he was mainly dealing with gameplay implementation, I used JavaScript to create the interaction of level transitions, cinematic playing and some user interfaces.

The final step was play-through and player experiences refinement. For example, adjust the character’s movement speed and movement smoothness and health bar length so players could have a reasonable playtime length.

3. 2. 3 Iteration and Release

Before the final graduate exhibition, “Haven” was shown at the Toronto’s Indie game show “Level Up 2013”, which was a 5-hour event that allowed independent game teams show their projects to the public. During players playing my game, I observed their behavior and talked to them to gain feedback.

Based on my observation and feedback, I iterated one gameplay in the second level, which will be introduced in the Gameplay Section. Moreover, I decided to add tutorial UI system to help players understanding the gameplay better.

After those iterations, bugs fixing and hardware adjustment (the Wii controller does not work with Mac with the Lion OS system), the game was finally released into public at the DFI Graduation Show, in which I received valuable feedback to support my further research reflection.

3. 3 Game Narrative

At the beginning, like every infant, the baby girl does not understand her environment; she loves brightness and is afraid of darkness; and she cries when she loses her toy or is scared. The sun does whatever he can, even sacrificing himself, to protect the baby girl and make her happy. Gradually, the baby girl grows up to be a teenager and, unlike when she was small, does not always follows the sun closely. The plants and animals in her backyard make her happy but also put her in danger. For example, in an early version of the game, she ran on the road and ignored the heavy traffic and in the

final version, she was threatened by icicles and snowballs. The sun sometimes gets mad but still loves and protects her as always and she thinks that he will be there for her forever. But at some point, she suddenly realizes that he is getting old and starts to be afraid of the darkness. In fact, the sun is getting weaker day by day and, eventually, cannot even move. She holds the sun and tries to run to warmer and brighter places but cannot stop the sun from getting old and weak and losing his brightness. At the end of the game the sun leaves her and goes back to the sky with a smile. In the original version, the girl suddenly wakes up in bed, realizes she had been dreaming and her mother comes to her side. Then they have breakfast together and her mother drives her to school. It is a nice sunny day and the girl looks up to the sky for 20 seconds and then she points to the sun and says to her mother: “Hey, Mom. I am kind of familiar with that guy.”

The game narrative is a conclusion of the emotion and experiences I want to express at this stage of my life. The girl is representative of myself and the sun stands for my families who protect and support me throughout my life. It was not until I graduated from the college, that I began to realize that my parents could actually get old and I experienced the loss of some of my family members. After reflection, I felt guilty for not caring about the people around me as much as I could have when I was a teenager. It is a well-known social issue in China, related to the “one couple, one child” policy that has been in effect in the country for the last 30 years, that the teenagers sometimes act selfishly, The only child becomes the center of the family, especially for those families with three generations living together. The child is cared for by up to six adults so it can be hard for them to care for the feelings of others without proper education. The third part

of the story reveals my sorrow caused by how time flies and the realization that I cannot stop it or change the fact that everyone will get old and die. The reason for the story originally happening in a dream is that when a family member passes, it is a nightmare for most people.

During the development of Haven, I kept reflecting the narrative in order to make meaning iteration to improve the personal narrative. I realized that the original version of the narrative actually showed feeling about positive and relief when the girl realized that the sun was still there somewhere. But my sick family members are still alive. My emotions are more about worry and afraid of their leaving. In current state, I do not know how I will feel when they really leave me. Moreover, I do not know how long it takes me to have that positive and relief emotions. As a game for self-expression, in order to express convincing emotions, I need to be honest to myself and express the true feeling. As a result, the game ends at when the girl witnesses the sun's leaving.

3.4 Applying empathy theory to the game narrative

As described above, according to one of Belman & Flanagan's empathetic game design principles (2007) a short burst of emotional empathy will be generated effectively if the desired emotion does not require a significant shift in the players beliefs about themselves, the real world, or themselves in relation to the real world. The game narrative addresses the emotion of regret associated with the limited time of a person's life and the deep love and care among family members. The emotions that players need to empathize

with, therefore, come from basic human relationships and common experiences of death. In this way, the game narrative can generate a short burst of emotional empathy according to the empathetic principle.

According to Belman and Flanagan for there to be empathy, it is also necessary for there to be some similarity between the players and the groups with whom they are supposed to empathize with (2007). In this case, the person that players are supposed to empathize with is me. We are similar regarding the common issues of limited life and limited lifetime. To conclude, the game narrative provides a foundation for players to empathize with me and understand the emotions that I expressed in my game.

3.5 Game World

“Game designers don't simply tell stories; they design worlds and sculpt spaces.”

-- Henry Jenkins

As an imaginary place, game worlds are much more than the sum of their pictures and sounds. The aesthetics of the game world can determine how players look at it and understand its relationship to reality. One of the purposes of a game world is to offer the player a space to explore and interact with (Adams, 2010). The game world of my game represents my real world by translating the components of real life into the elements in the game world. For example, I grew up from a baby to an adolescent and then to a young adult. Similarly, three levels are built into the game to express the character at different ages. In the three levels, the relationship between the girl and the sun changes from the

girl being protected by the sun to the girl protecting the sun, a transition which reflects my changing relationship to my family: initially I was protected by my family but now I want to protect those old family members.

In traditional narrative building, narrative is driven by events. Most often, the term game story refers to games that either enable players to perform or witness narrative events (Jenkins, 2004) and those events form the linear story and shape the complex relationship between characters. In my game, narrative is driven by time and process, rather than specific events because the specific family conditions of every individual are different and those differences could prevent empathy and block the understanding of my self-expression. Through spending time together with the characters in the game world, the player develops stronger emotion and empathy and an understanding of the process of growing up and saying good-bye to a beloved dying family member. In this way, the abstract game world will remind players about their own experiences.

My game summarizes a long life process in a short game process. The game settings are divided into three levels that represent three stages of the game character's life. According to Jenkins' concept of evocative space, memories and images that inspire the game story should be given concrete form and built into the game world in order to create an immersive environment that the player could wander through and interact with. The immersive environment helps tell the story by embedding narrative information within the game scene (Jenkins, 2002). Therefore, when building the game world, all chosen elements should embed information that helps players understand the game narrative. In building the game spaces of different levels, the elements such as enemy and

environments mostly came from significant places or objects in my own memory of the time period that the level related to. Specific details and examples will be described below.

3.5.1 Game characters:

The game world is divided into three sections that based on the life stage of the girl and the Sun. In the first section, the girl is a baby and the sun is a young adult. In the later sections the girl grows up through adolescence into young adult. Meanwhile the sun gradually gets old and lose his brightness. The development three sections of game world are largely decided by the age of the characters. The girl (Figure 10), my representative in

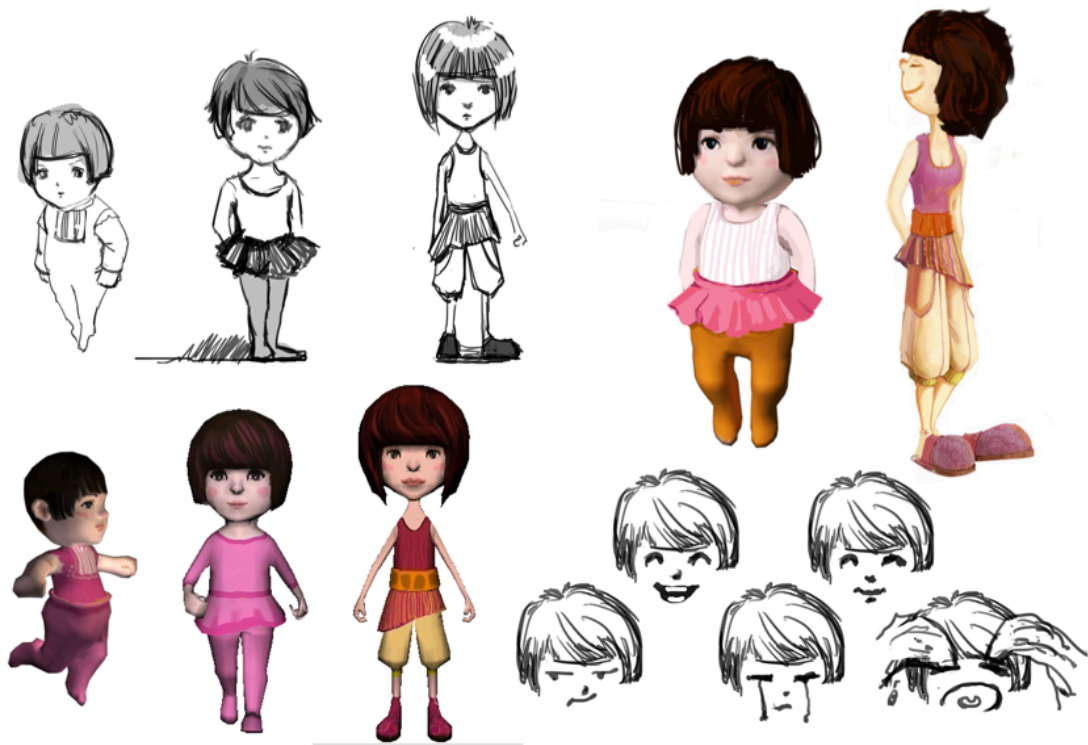


Figure 14: Design process of the girl

the game experienced the same periods of life as me— a teenager who just be a young adult who carries different duties, plays different roles and starting to consider taking care of her family. In order to build the narrative empathy, players need to know the age change of the main characters. The changes of the appearances of the characters are the easiest way to communicate this narrative to the players. This thesis is about game as self-expression. The setting of the main character is an Asian girl with the same haircut of my childhood (Figure 15), which builds a tighter bond between the game and me as



Figure 15: Photos of my childhood

well as players and me. The art look of the girl is also part of my self-expression. The sun abstractly represents my family, those who keep delivering brightness and warmth. I want to show my gratitude, love and respect to them. The concept art shows clearly the age

feature of the sun (Figure 16). As in order to create narrative empathy inside players, they



Figure 16: The Sun

need to be clearly communicated with the situations of the game characters. (Oatley, 2012) As mentioned in previous chapter, the key point of the game is allowing the players experience my life process. The special effect is also an application of using art elements to contribute to the game narrative. When the sun is young, the FX around him shows his energy. The FX during his older age is falling light that presents his leaking lifetime. (Figure 17)



Figure 17: Sun in his old age

If the adult character, instead of the sun, but a realistic person, then the game has to build gameplay that based the characteristic of that person which limits the possibility to create innovative interactive gameplay. For example, sun could generate light and heat to interactive with the game world and goes against gravity, which has more movement and behavior possibilities compared with a human character.

3.5.2 Game world breakdown by levels

From the narrative construction view, the characters, in many cases, are the guides for these richly developed worlds. They are bare bones, description displaces exposition, and plots fragment into a series of episodes and encounters (Jenkins, 2004). The environment settings of each level need to fit to the narrative requirements of the certain stages of the girl and the sun.

In the first level, the game world is quiet and abstract. This is because the emotional state of the baby girl is peaceful and innocent. She is still cannot really feel the difference between the current environment and her mother's belly. I was born and grew up in a seaside city. The sea evokes feelings similar to my mother, my home, - silent and infinite. That's why the dominant color of this level is deep blue. (Figure 9) Most people do not have clear memory when they are still babies. The memory of an 18-month-olds infant could only last for as long as 13 weeks (Hartshorn, 1998). That is the reason why most elements in the first level are not really existed in the reality. Because the sun stands for light, most environmental hazards are inspired by shadow. The main relationship

between the two characters is protection and being protected, which is represented by the sun generating light balls by burning himself to dissipate the shadow. The art style of this level is more like the style of musical stage decorations with painted foreground that builds the narrative of people only has blurry memory in their early lives. In order to enhance that style, compared with realistic 3D models, I added more flat geometric shapes to the foregrounds (Figure 18).

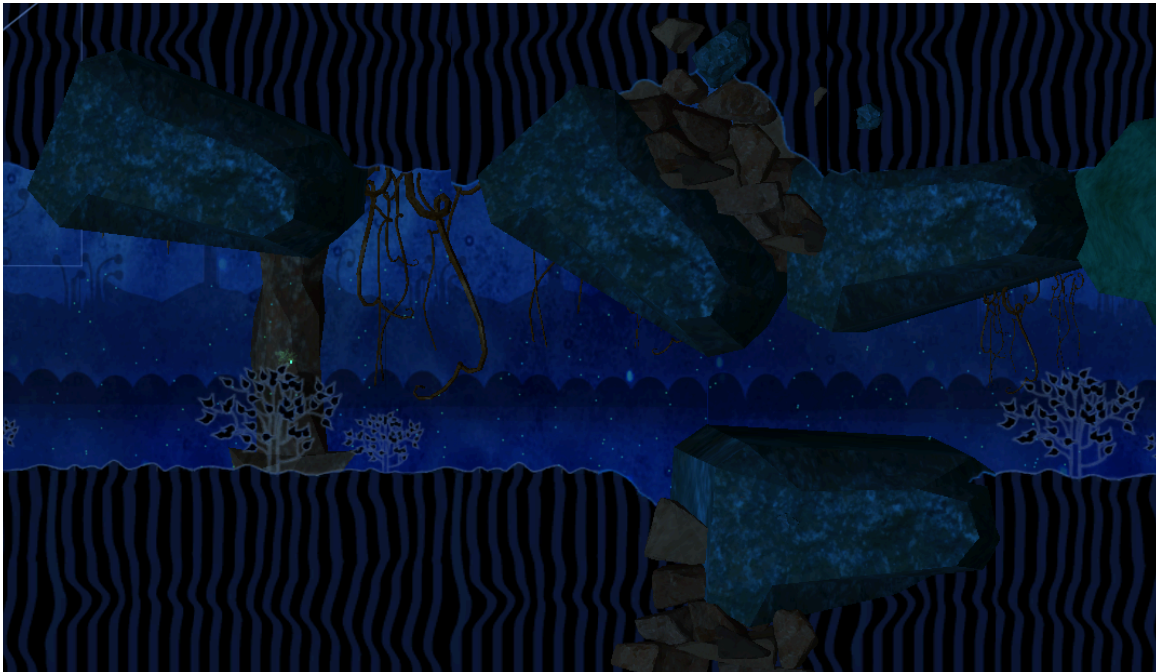


Figure 18: Geometric foreground

Compared with the first level, the second level is more bright and vivid. The main environment setting of this level is in the early spring, when the snow begins to melt and the world is colored with bright green. For a new baby who just starts to play outside with full curiosity, the world is always bright and lively, filled with beauty and happiness. The location setting is in the backyard of the home of the baby girl, a proper location for a

little kid who just knows how to walk. I spent 5 years in the backyard of my family (Figure 19), growing vegetables, running, falling over, getting scared by the caterpillar



Figure 19: The old backyard

worms and knocking head by the ice balls dropping of from the. That was an important period of my life that I spent with my grandparents. During that time I never worried about anything. I want to recreate the experience of that period to my players and the snowball and vegetable show in figure 20 are inspired by my memories of that period. The first step of narrative empathy, which is also the key to create empathy, is reminding players about the memory of certain occasion. The back yard has really large possibilities to exist in players' memories when they just knew how to walk. So they could be past to the second step of narrative empathy, to experience their feeling of joyful young age.



Figure 20: Concept art of the second level

In the third level, the nightfall will gradually come. Firstly, this describes the fast flowing of time especially when beloved people are leaving us. Secondly, it communicates to the players that the sun in the game is not the real Sun but an important character that spends his life to protect the girl. The theme of this level is departure. As the environment need to serve the role of building narrative (Jenkins, 2004), the whole level happens during the nightfall, and has the same duration as the life stage of the sun character who is in his old age. The main color is purple that forms a sad motif (Figure 21), which shows a strong contract to the vivid green of that second level. There will also be falling leaves and strong wind, together with the wild mountain sceneries that show

the sadness of the girl who just grows up but has to face the separation between her and the person that cannot protect her anymore. The setting is help to arouse the sadness emotions of the players. The pay-off of emotional investment will be stronger when the sun finally leaves the girl.



Figure 21: Concept art of the third level

3.6 Game Rules:

The rules of a game determine the rights and responsibilities of the players and the goal of the players, so the players could connect to the characters by controlling them by obeying rules. Following the approaches advocated by Belman & Flanagan (2007), players' empathy for the characters by creating corresponding rules throughout the game

and informative feedback of players interactive behaviors. Game rules maintain the game narrative through interaction. The goal of the game is leading the baby girl through the early stage of his life thereby maintaining a happy emotion will communicate to players at the every beginning of the game and retain the same throughout the first level and second level.

3.6.1 Unrecovered sun:

The main rule throughout the game is based on that the sun needs to sacrifice himself to protect the girl and make the girl happy. The narrative of the game is presenting a sad story that people can never stop time. The sun represents for the family, so the energy of the sun is not recoverable which stand for the unstoppable time. Every time when the sun releases his energy to protect the girl, the length of the energy bar of the sun will reduce that decides sun in which stage of his life. As the game is trying to build the empathy process instead of moving events, so the events that decide the level transition is the level in the energy bar of the sun. When the energy is reduced to $2/3$, the second level will be loaded, when $1/3$, the third loaded. In the third level, the energy bar will keep lower and lower no matter what player do, which means the unstoppable passing of time. That's also meant to create a strong feeling of anxiety for the last level so players will have deeply engage at the end of the last level and see the end of the game. In the original rules setting, the sun is undefeatable, but he need donate some if his light to resolve puzzles to help with the girl. But then I realize it is hard to build the narrative that they experience life together and cannot communicate the transition of relationship

between the girl and the sun. If the rules and achieve those listed above, then game does not follow Jenkins's (2004) game as narrative architecture idea. Players will barely have narrative empathy to the emotion that I express in the narrative, if the narrative is not clear in the game.

3.6.2 Emotion system:

The goal of the game is to make the girl happy. So the moods of the girl need to be visible. This emotion system is to visualize the emotion of the girl character. First, as the rule of the game is to protect the girl and make her happy. Players need to be informed with the current emotion of the girl. In the first level, the girl will get happy when there are fireflies flying around her and become unhappy when touched by the shadow or spiders. Based on the second empathy game design principle states in the theory foundation, the players need to be communicated about how their action could solve the issue represented in game. (Belman, Flanagan 2007) If they control the sun to lead the girl gets a firefly, the girl become happier then the players will know that their action of helping the girl get the firefly could achieve the goal of making the girl happy by noticing the visualized girl's emotion. In the second level, as long as she is running without being interrupted by the snowball or unplanted ground, she will be happy as small kids are happy by even simply running around. In the last level, the emotion system will show the sadness of the girl holding the sun running and witnessing the sun's departure.

3.6.3 Gameplay breakdown by levels

The gameplay could also build the narrative. The character controls in the three levels are different which describe the relationship between the girl and the sun. In the first level, the girl will tightly follow the sun. In the second level, the girl walking around without caring about where the sun is, players control the sun to cleaning the girl's road so she could playing around safely. In the third level, the sun could not move anymore, players control the girl hold the sun keep running to the bright place where the sun could live longer. The process tells the narrative that the changing of age and time in the two characters. Babies could not move are always lying at where parents put them in. Teenagers start to have their own thought are easily ignore the parents' feel or behave against them. Finally, the cycles of life show, the elder people need to be taking care of as babies.

The fear factors of the first level are shadow monsters, lava walls, dropping stones and spiders. The sun will lead the moving path of the baby to pass these dangers. The spiders and those shadow monsters are more about those objects that are not really dangerous but will scare small kids. The tension from a players perspective now are come from those assets that seems scary, which will draw a strong contrast comparing with in third level that features the fear of the girl's loss of a real family.

In second level, the girl is no longer following the sun but running by herself, which enhance the narrative that the young generations grow up and less controlled by their parents. The sun needs to melt the snow on the girl's running path to ensure she

could run happily as she will cry if she is hit by the falling icicles. During the play test, it was shown proved that female players show more empathy to the game narrative and game characters. During the play test, most male players just ignored the girl but break all the falling icicles far before ahead the girl's arriving. But one female player just always controlled the sun in a visible distance from the girl and spoke encourage words to the girl character to ask her walk faster. In another case, a female player played together with a male player, when male player failed to protect the girl character, the female players pointed to the screen UI and told the male player that the girl cried and ask him to pay more attention on protecting the girl. On one hand, it is valuable to know that female players show stronger empathy to the game characters, on the other hand, the gameplay of the second level need to improve in order to create more empathy for the male players. So the solution is if the sun leaves the girl for a certain distance, players could hear crying sound track that remind players that children need their parents by their side which also enhance the relationships described in the narrative of this level which grown-up kids need freedom to carry activity but also need parents by their side.

The gameplay of the third level is a race with time (more detailed gameplay are introduced in Appendix B: Game design document). The sun is too old to protect the girl, and the energy bar keeps become shorter. The girl needs to keep her sun under the real Sun so the energy bar will shorten in a slower way. There will be barriers and cliffs on the roads. If the barriers trap the girl, the nightfall will quickly arrive. If the girl falls off the cliffs, the sun will use his energy to create a solid stone to fill the cliffs to protect the girl. As a consequence, the sun will lose large amounts of energy. The settings present the

love of older generations, protecting their offspring till the end of their life. And the narrative embeds in the level is families could suddenly get old and very sick, no matter how hard we try, they still will leave us. Here I want express my guilty feeling that I cannot accompany with the dying family. In order to express this narrative and trigger players' empathy of my guilty emotions, animation plays an essential role of enhancing the narrative empathy. When is girl falls down because of failure by the players, the animation will show that the girl cannot hold the sun and old sun will be thrown off, rolling on the ground. (Figure 22) When players see the animation as one of esthetic

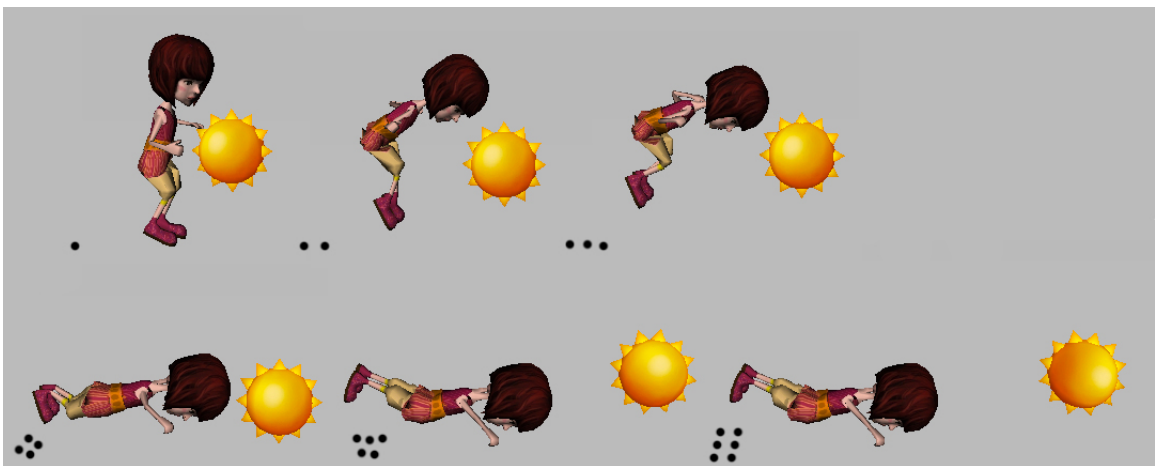


Figure 22: The falling down animation

experience, they could empathize with the pain on the body of both the girl and the sun. The unbalance body figure could generate physical empathy then transfer to an uncomfortable emotional feeling. (Freedlgerg and Gallese, 2007) People will feel guilty when they hurt a serious patient, especially when they trying to offer help, when the patient is their beloved, so does the players. The thrown sun is expected to trigger players' sense of guilt, reminding them about the emotion when they are in this situation so the

second step of narrative empathy is created.

3.7 Player

Players make the video game a game because without them, videogames are just clusters of computer code and image (Galloway: 2006). Besides the observer role that witnesses the game process, players are also actors who participate in the game by controlling the game characters to interact with the game world.

The two different roles generate two different emotion classes. One emotion class is called narrative emotion. The narrative emotions are based on a videogame's characters, settings and event. They are the most common emotions we feel when engaging with artworks. (Frome, 2007) For example: Players will feel joy when the sun in the game successfully protects the girl and makes her happy. Player will feel sad when the sun gets old and has to leave the girl after the long accompanying journey. So they will feel empathy for the emotions I want to.

The players' emotional experience of a game is not totally set by the emotion expressed by the game, it is also comes from the gameplay experience, which is called game emotion. Game emotions are more similar with the emotion of competition that is generated by winning, losing, accomplishment and frustration. (Frome, 2007) For example, player might feel frustration by repetitive death. So players will be distracted from the narrative emotions that I want to express. In order to create empathy that could deeply touch the players with the narrative emotion (Frome, 2007), the gameplay should

protect player from those distractions so they could empathize for the main emotion expressed in game. Also the emotion in the game is emphasized throughout the gaming process. So the game should attract the game players to finish the game in order to go over the game story.

3.7.1 The Solution

As the extension of flow theory, the dynamic difficulty adjustment has been shown to ensure players' play experiences by keeping the player staying in their flow zone where players could concentrate on playing the game comfortably. In Resident Evil 5 (2009), a third person shooter video game developed the dynamic difficulty adjustment method into a system call "Difficulty Scale". The system grades the players' performance from 1 to 10. Based on the grade, the system adjusts then the enemy's behavior and enemy amount to suits the players' performance. The system provides an idea that adjusts the enemy's artificial intelligence and enemy's amount that I could use in my project to adjust the shadow monster based on player's performance

3.7.2 Passive dynamic difficulty adjustment:

In most games, the levels are pre-built before player is involved. In my game, one big level is divided into small chunks, so the level is dynamic. As the game is an action game, the environment of the level also influence on the difficulty, so simply apply the The Resident Evil 5's system to adjust the enemy amount could not totally function to

change the difficulty of the level. Those small chunks contain gameplay with different difficulty but similar narrative. The game will then load subsequent chunks by analyzing player's performance to date (Figure 23).

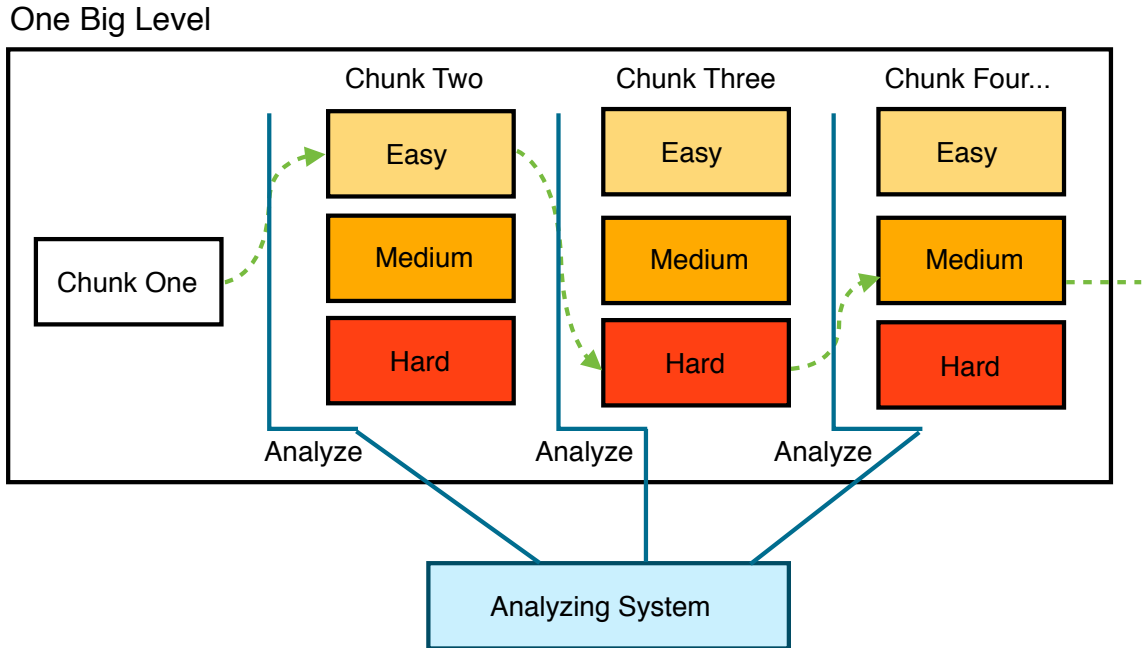


Figure 23: Chunk-based level design

Based on the non-linear concept above, the system could evaluate player's performance. If in a certain period of time, the performance of the player is not good enough; the system will automatically load an easier level for the players to reduce the anxiety that breaks the flow state. The performance line should be dynamic. If the performance score keeps within the highest area, it is to say that players could handle the task too easy then they will feel boring quickly. One serious possibility at this time is player may just give up playing the game. So they cannot continue to experience the story that embodied my emotion in it. Then the game won't be empathic. As soon as the

analyzing system detects this situation, a more difficulty level chunk will load for players to challenging them in a positive way.

The analyzing systems helps player maintain their emotion states within flow as it could identify player's skill level and assign player a level chunk with certain difficulty settings that align with player's skill level. So players will not feel depressed by repetitive fail nor get humdrum due to a lack of challenge. So to achieve the goal that helps game players focus on the game world and game narration without being distracted by game rules to ensure the successful empathy.

3.8 Emotional response tests and research

Referring back to the goal of my thesis (to express personal emotion via game development and to facilitate feelings of empathy to players) the evaluation of players' emotional responses after playing this game is one possible way to test the quality of the outcome of my thesis work. The nature of emotion has been the subject of much debate; it is mostly considered a multifaceted process involving coordinated changes in peripheral and central physiology (Thayer & Siegle, 2002). The changes in a player's physiology provide the possibility to evaluate emotion by measuring physiology values. The heart rate is emerging as an objective measure of individual difference in regulated emotional responding, particularly as it relates to social processes and mental health (Bradley and Linda, 2006). But based on Bradley's research (2006), in order to evaluate emotion, the heart rate data needs to be extremely precise so that the emotional event can

be identified by analyzing the curve between two heartbeats. The only sensor available for prototyping this research is the pulse sensor (Figure 24) made by the media artist Joel

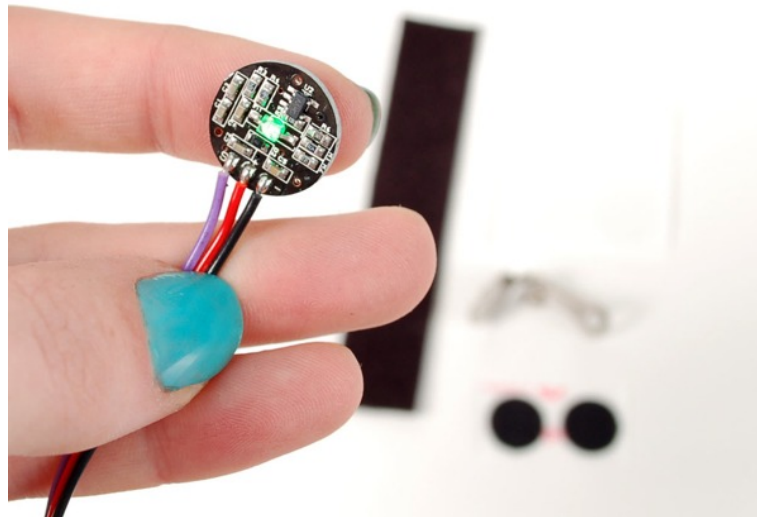


Figure 24: The pulse sensor

Murphy who teaches at the New School. After I tested this sensor, I found the data could only be as precise as the count of beats per minute, which does not reach the requirement of evaluating emotions.

Instead of the scientific method, I chose to examine the players' emotional responses to my game, which I collected during the graduate gallery exhibition in a notebook placed beside the game. I asked the players to write their feelings about the game experience in the notebook. Figure 25 is the images of feedback I received from the exhibition. Most players said they felt sad when they played the third level. Female players likely showed more empathy to the relationship of the characters as female players often showed more patients when they protected the girl. On the contrary, when

being asked if the game reminds them about their lives, male players said, as this was a life of a girl, they more so enjoyed the game graphics, gameplay and the transitions

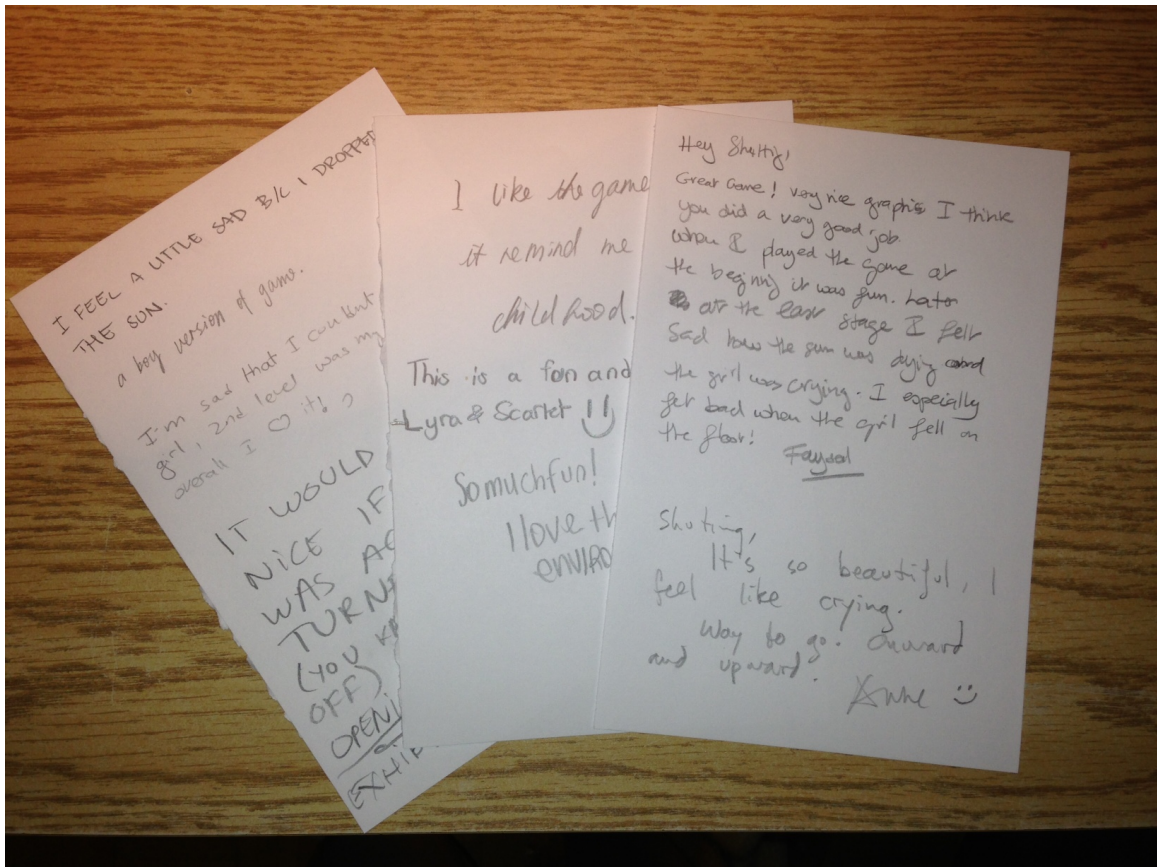


Figure 25: Game Feedback

between the characters' relationships rather than a connection to their lives. This outcome is congruent to the theory research I conducted. According to my research, players show more empathy when they are similar with the group they are supposed to empathize with (Belman and Flanagan, 2009). The female players have more similarities with me (the girl character) so they show stronger empathy to the game of my self-expression.

4. Conclusion

This thesis has explored the mechanics of using digital game and empathy theory as tools for self-expression. The game reveals what drives me to make this self-expression — my beloved family who has supported my choices and never expecting me to support them back. They gave me the inspiration to do this exploration during which I encountered and found remarkable theory and scholars' ideas about narrative and empathy. The stages of this thesis research have supported me in making decisions and conducting reflections about the game-making project.

I am encouraged by Jenova's innovative ideas of seeking ways to build positive emotion into videogames, even in the interactive media field; furthermore, he proved his opinion by actions. I have devoted a great deal of energy discussing in detail how narrative is formed in my art game making process and how that narrative together with the gameplay can facilitate a player's empathy because all of these facets are all important in order to make my self-expression possible. Whether or not my game is considered art by the players, is not my highest concern because the research exploration and the expressive game are the most important aspects for me in this process.

At this stage, I realize that empathy is not the only way to create meaningful emotions within the players during gameplay. This game project is just a starting point for me. I will keep exploring further possible approaches to foster and create positive emotions through interaction experiences.

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Appendix A: Game Design Document

Intro

The theme of the game is about the love within a family. The story is about a sun protect a little boy through his growing up process even by donating or weakening herself.

The goal of the game is trying to explore how to use empathy as a tool to enhance a deeper emotion game experience for the players. Another experiential point is to build a high artificial intelligence game system that adjust the hardness dynamically so every player could enjoy the emotion experience as well as the interactivity without annoyed by the repetitive failure.

Character bios

The Sun: his mission is to protect the girl so she could grow up happily and safely. The sun could generate light by INPUT ONE.

The boy: a new baby who will go through every common life stage of a normal child.

Rough plot

The game is a 2.5D platform game combined with action and puzzle gameplay elements.

During the whole three levels, the Sun need to protect the girl from being hurt or scared.

The girl will grow up from a dreaming-baby to a naughty girl and then have some ability to protect back her family. Besides the action gameplay through out, each level has two

puzzles that related with color and light. The hardness dynamic is achieved by the pulse count of the players. If players get hurt too much or the pulse is too high, then the game will automatically load a chunk of level that easier. If the player keeps performing well, the game will become harder by using the same method. In additional, player will receive reward level chunk for excellent performance.

Hardware:

- **Wii controller:** shaking to control the sun, INPUT ONE to call light ball

Gameplay description:

General dynamic mechanics: the game will adjust the lightness and background music of the game dynamically to enhance certain experiences.

- **The first level:** the environment will be in the baby girl's dream, so the movement is not influenced by the gravity. The boy will follow the movement of the Sun tightly. (Figure 26)
 - **Gameplay:** Avoid dangerous
 - **Rewards:** Fireflies.
 - **Hazards:** Shadow related creatures, falling rocks, spiders
- **The Second level:** the boy is grown up a little bit so he could play around in the back yard.
 - **Gameplay:** Light the plant so they can grow up to build the road.
 - **Hazards:** Gap, snow balls, ice spikes.

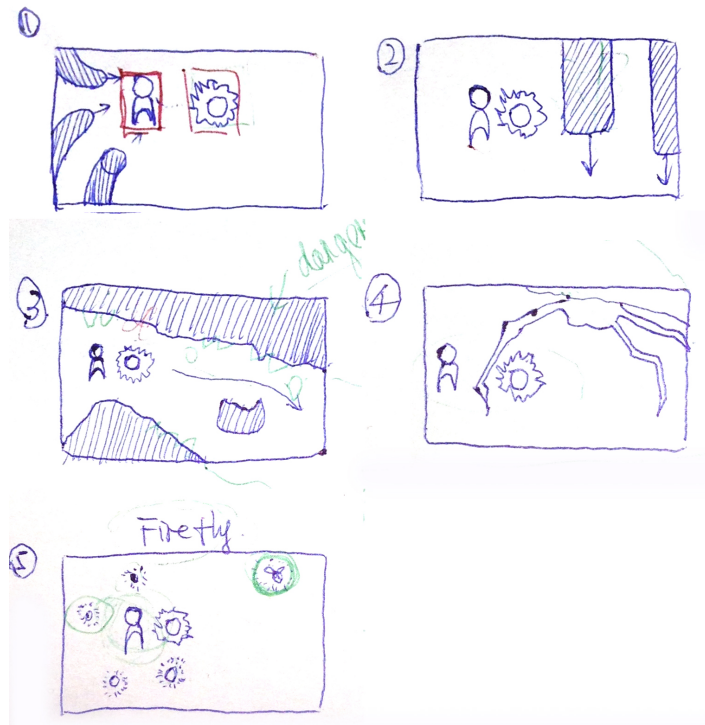


Figure 26: Game design Sketch

- **The third level:** the boy will become naughty. Education and personal safety will become the issue.
 - **Gameplay:** Stop traffic light.
 - **Rewards:** need to be specified.
 - **Hazards:** rocks, cliffs

Systematic breakdown of components

Asset breakdown

- Art Assets: Sun's model/animation

Two stage of baby/ 2 years old/ 4 years old

Background 1/ background 2 (each level has two background, which means 6

background need to be produced)

Environment objects and their animation

Title animation

Main menu UI/ in-game UI

Project development schedule (Figure 27)

Level	Function&Description	Status	Comment	Time schedule	Art Assets and level Schedule
one	Emotion System	Finish		March 6 to March 9	March 6 to March 11
	Character Control: will pointing	almost	when goes different direction, the two characters all facing opposite directions		
	Fireflies	Finish	Could route faster and flying around with some randomly		
	Dynamic level	Finish			
	The moving shadow spider environment	Finish	now it seems only disappear when crash on the baby not the sun trying to achieve without coding		
Two	Snow ball (detail update tomorrow)			March 18 to March 26	March 19 to March 27
	icicles (detail update tomorrow)				
	Plants (detail update tomorrow)				
	Character Control: Sun: will pointing, press button to generate ligh ball(need to discuss)				
	worn(if have time)(detail update tomorrow)				
I will arrange a user test during March 20 to March 28, in case Steve need anything related with users test in your report					
Three	Character control:the girl holds the sun Move left and right with will. Jump over barriers and cliffs by press whatever will button. (Rough models will be provided by March 10 so you can have some models to code on)	Pending	As the third level is short and has bigger different gameply compared with the pervious ones, so just work on this ahead of level 2	March 10 to March 17	March 12 to March 18
	Blocked by the barrier: If the girl falls jump over the barriers, she will fall and wait for two seconds to provide the models, the models will be provided by March 10 so you can have some models to code on)	Pending			
	Blocked by the barrier: If the girl falls jump over the barriers, she will fall and wait for two seconds to keep running. The nightfall sky will appear in the scene	Pending			
	Fall of cliff:if the girl falls of the cliff the sun will save her and lose large amount of energy. One solution could be sun generates some FX and the girl automatically placing in a safe location. Or create some solid model to fill the cliff (Something like you do for your last game)	Pending			
	Day and night system: something similar with tiny wings. If the girl move too slow, the nightfall will arrive so the sun will loses energy faster. The rythem could take temple run as example: once trapped, the nightfall comes and then disapper gradually. During the daytime, the sun will lose his energy slower but the key point here is the energy lose anyway.	Pending			
User instructions & functions implication & experience improment	Main Menu: When the controller has not been moved for 1 min, the menu will be appear with options "continue" or "restart"	Pending		March 27- April 5	March 28- April 5 User instruction drawing
	Instructions apper time: the beginning of each leve, the first time encouger with new gameplay and every time "continue"	Pending			
	Fixed those flaws related with art assest	Pending			
Play through and ending cinematics production	Brent: Play through the game and identify flaws	Pending		April 6- April 8	April 6- April 8 cinematics production
	Shuting: Fixed those flaws related with art assest and product game-end cinematics in the narrative document	Pending			
Model Replacement					April 16- April 19 Exhibition Players will be asked to leave what they think about the game, the emotions of playing the game and what the game reminds them about.

Figure 27: Development schedule

Appendix B: Game Design Process Work

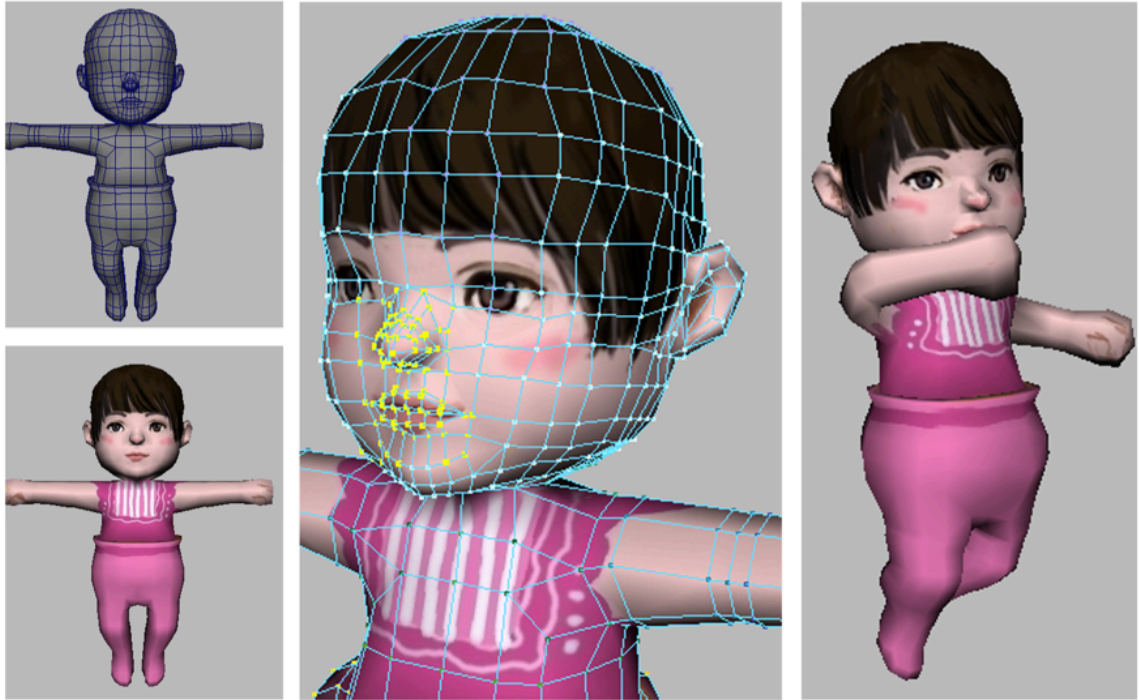


Figure 28: Making of the baby girl character

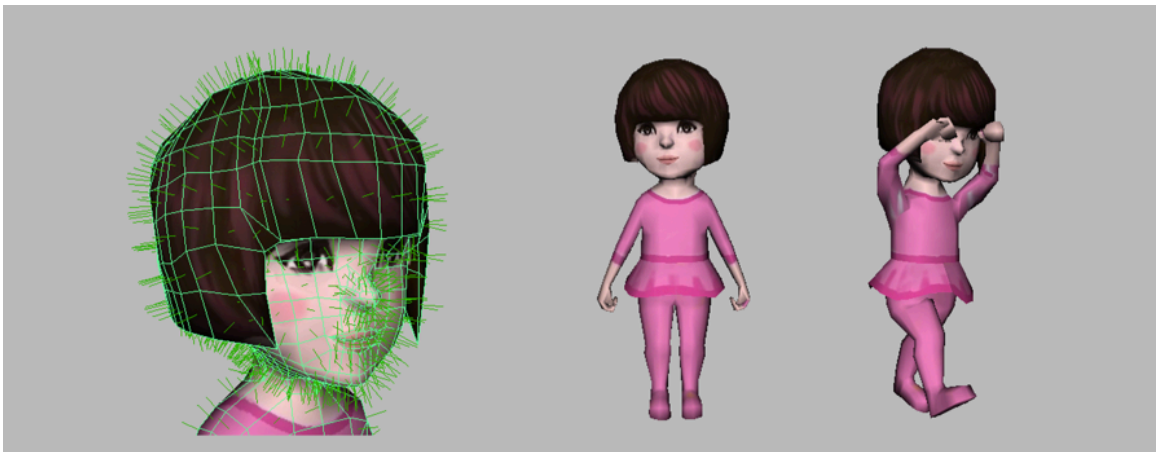


Figure 29: Normal adjustment of the girl character in second level

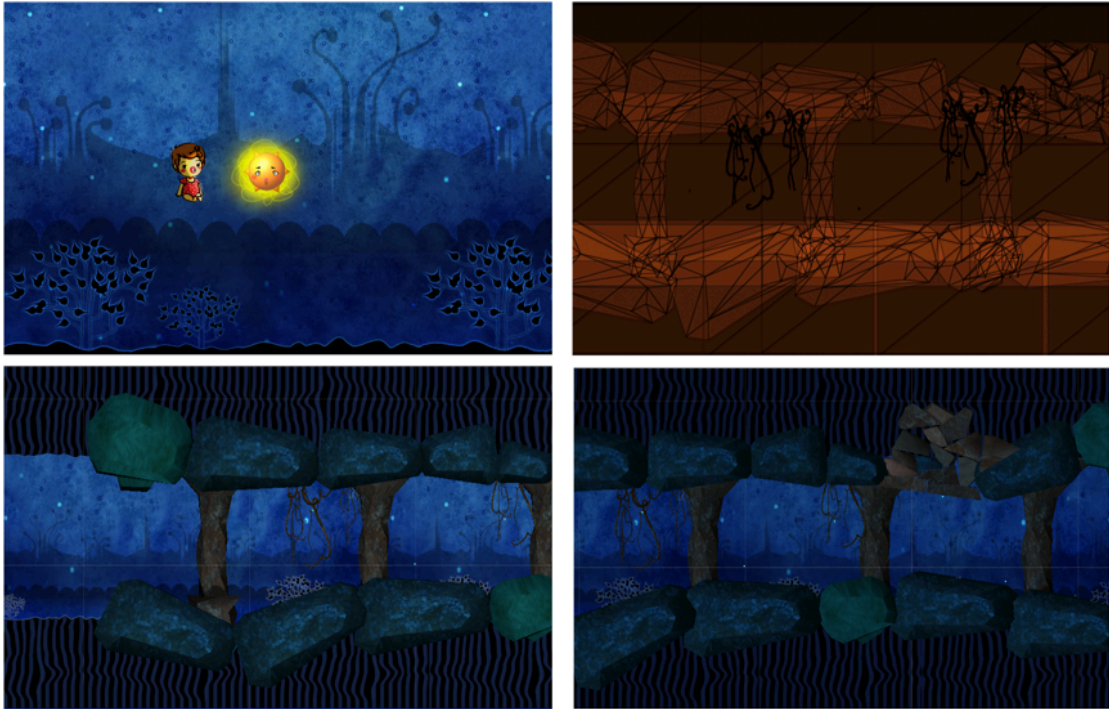


Figure 30: Process of creating the first level

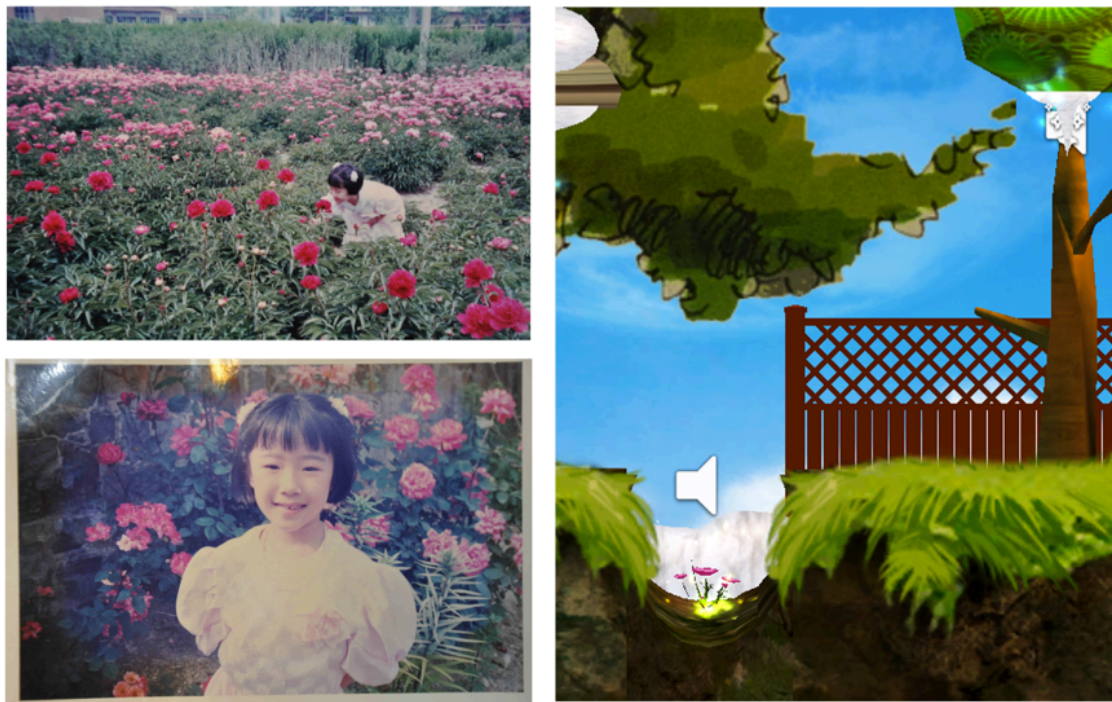


Figure 31: Mood board of the second level

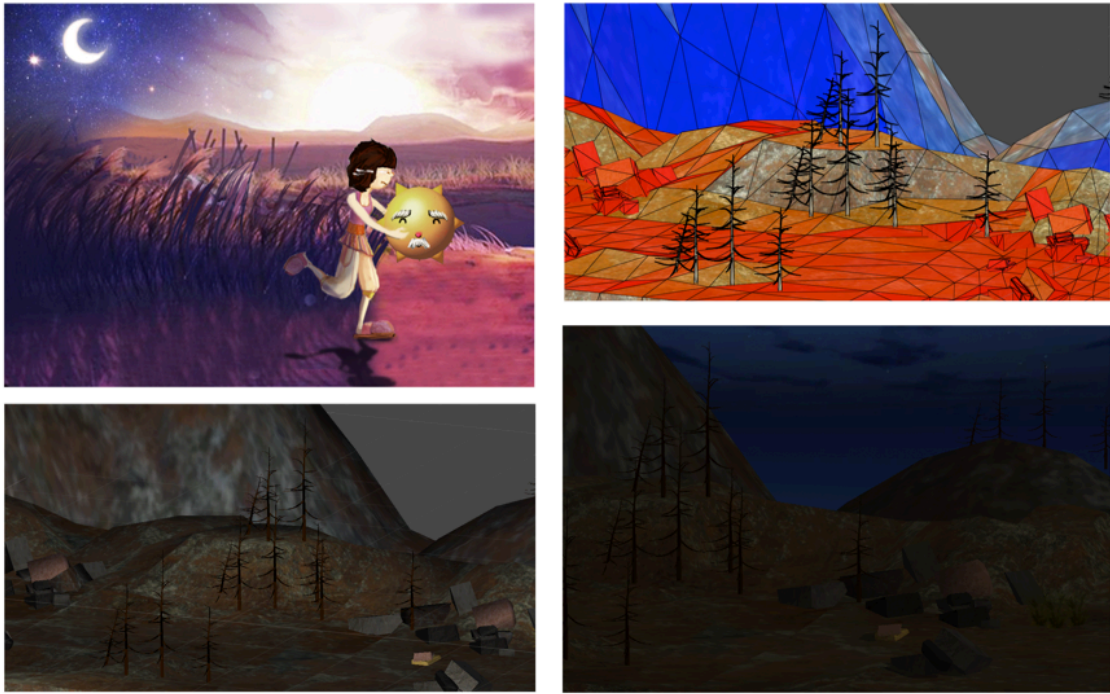


Figure 32: Development of the third level