

Bringing Meta-Narratives into indexical storytelling: How does it influence the player?

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Att kombinera Metanarrativ med Indexical
Storytelling: Hur påverkar det spelaren?

Abstract

This study examines how indexical storytelling, compared to meta-narratives, affects the player in terms of the themes narrative interpretation, immersion and self-reflection. The study includes a design project, the creation of a video game with two separate versions, that was used to examine these topics. The first version had indexical storytelling, and the second had a combination of indexical storytelling and a meta-narrative. Interviews were held with five participants playing the video game version with indexical storytelling, and five participants playing the other version with a meta-narrative added. The methods used in this study were in-depth interviews and thematic analysis. The analysis results were discussed based on the main themes of the study, consisting of narrative interpretation, immersion and self-reflection in each version of the game. The purpose of the study was to identify factors that may influence immersion and self-reflection and give players a better insight into the narrative in video games. The results indicate that both indexical storytelling on its own and together with a meta-narrative influenced players immersion, narrative interpretation and self-reflection, but self-reflection was further enhanced by the meta-narrative. It made the players reflect on their personal life through the game's character speaking about their life. This reflection was not as evident when only indexical storytelling was present in the game.

Keywords: Indexical storytelling, Meta-narrative, Reflection, Immersion, Narrative

Abstrakt

Denna studie undersöker hur indexical storytelling, jämfört med metanarrativ, påverkar spelaren utifrån teman som narrativ tolkning, immersion och självreflektion. Studien inkluderar ett designprojekt där ett videospel skapades i två separata versioner för att undersöka dessa ämnen. Den första versionen använde indexical storytelling, medan den andra hade en kombination av indexical storytelling och ett metanarrativ. Studien inkluderar intervjuer med fem deltagare som spelade ett datorspel med indexical storytelling och fem deltagare som spelade ett liknande datorspel där ett metanarrativ hade lagts till. De metoder som användes i studien var djupintervjuer och tematisk analys. Analysens resultat diskuterades utifrån studien huvudtema, som bestod av narrativ tolkning, immersion och självreflektion i respektive version av spelet. Syftet med studien var att identifiera faktorer som kan påverka immersion och självreflektion och ge spelare en bättre förståelse för narrativet i datorspel. Resultaten indikerar att både indexical storytelling på egen hand och i kombination med ett metanarrativ påverkar spelarens immersion, självreflektion och narrativa tolkning, men självreflektion stärktes ytterligare av metanarrativet. Det fick spelarna att reflektera över sina egna liv genom att spelets karaktär talade om sitt liv. Denna reflektion var inte lika framträdande när endast indexical storytelling var närvarande.

Keywords: Indexical storytelling, metanarrativ, reflektion, immersion, narrativ

Table of Contents

Introduction	5
Related Research	7
Research Question / Purpose	9
Methods	10
Design Project	10
Creation of the artifact	10
Context of the game	11
Implementation of Indexical Storytelling	11
Implementation of Meta-Narrative	13
Data Gathering	14
Data Analysis	15
Results	17
Version 1	17
Immersion	17
Narrative Interpretation	18
Self-Reflection	19
Version 2	19
Immersion	19
Narrative Interpretation	19
Self-Reflection	20
Discussion	22
Immersion	22
Narrative interpretation	23
Self-reflection	23
Limitations	24
Conclusions	26
References	27
Appendix	29

Introduction

According to Jenkins (2004, 119), narrative experiences are often an ambition that game designers strive to give players. There have been discussions about how the design of spaces can convey stories of game worlds in different ways (Fernandez-Vara 2011, 4). This is a topic that this essay will look at more closely.

When playing a digital game, a feeling of engagement or involvement can arise. This feeling is called immersion, and it is present when a person feels like they are inside the game world (Murray 2017, 124). Immersion in video games differs from the immersion of books or movies in the sense that videogames are spatial and give the player the opportunity to move around inside the space (Murray 2017, 96).

Immersion can come from different parts of the gaming experience, and one part is the game's narrative (Cairns, Cox and Nordin 2014, 12). There is debate about whether all games have some type of narrative or not, but it is safe to say that games can have narratives (Cairns, Cox and Nordin 2014, 11). Aarseth (2012, 3) points out that games and narratives, although their differences, have several common denominators. The author explains that both consist of a world, events happening, characters and objects. What sets game narratives apart from traditional narratives, like in books and movies, is their interactivity, their flexible and multisequential (Murray 2017, 73-4) structure that allows players to explore the story more freely and their integration of gameplay within the narrative to drive the progress forward (Qin, Rau and Salvendy 2009, 107). Koenitz (2023, 3) separates interactivity into two types. The first one is based on speculation, where mediums give room for people's own interpretations and imagination – this type is present in all kinds of mediums. The second type is based upon the planning and execution that is possible only in digital mediums. Koenitz explains that this type of interactivity gives players the possibility to plan what they want to do and then execute these plans in digital mediums (2023, 2-3).

One type of narrative that can be used in digital games, that engages the player by reflecting on the game's own creation, is meta-narratives. It contributes to the players' awareness of the narrative structure and the narrators' interpretations and thoughts (Depboylu 2024, 549).

According to Kocurek (2018, 3), both storytellers and game designers convey lived experiences through their respective mediums, showing a connection between storytelling and playing games. Kocurek describes storytelling as a type of fiction where the audience is encouraged to imagine as if the story is real and try to place themselves in the position of, for example, a character, even though they know it is not real (2018, 4).

Similar to theme park design, storytelling can be used in games to create narrative experiences by allowing players to navigate evocative spaces (Fernandez-Vara 2011, 3). This is called environmental storytelling, and it is a broad concept that, according to Fernandez-Vara, consists of two central ideas. Firstly, the narrative is shaped by the space and by exploring the objects distributed in the space, players can construct the narrative sequence. Secondly, the player is required to interpret objects and events in the space to put the narrative pieces together (Fernandez-Vara 2011, 4).

By digging deeper into environmental storytelling, one can find specific concepts, like indexical storytelling. Indexical storytelling is used in games to convey stories by leaving traces (Fernandez-Vara 2011, 6). The concept originates from Charles Peirce's semiotics, the philosophy that signs "conveys to a mind an idea about a thing" (Fernandez-Vara 2011, 5). These signs can be in the shape of symbols, icons and indices, and are mainly used as indices to convey the narratives (2011, 5-6).

No studies can be found that tries to compare how the concept of indexical storytelling and meta-narratives affect players in different aspects. This study will focus specifically on how indexical storytelling, with and without a meta-narrative present, affects players immersion, narrative interpretation and self-reflection.

Related Research

Environmental Storytelling is a concept used by theme park designers to put guests into a space that can be used to convey a story that the designers are trying to tell (Fernandez-Vara 2011, 3). Jenkins (2004, 123) describes how environmental storytelling can be used to create immersive narrative experiences in several ways. It can be done by letting people associate the narrative with pre-existing information, providing a space where narrative events can take place, embedding narrative information in the scene and providing resources for an emerging narrative to take place (2004, 123).

Fernandez-Vara builds further upon environmental storytelling with a new concept that the author refers to as *indexical storytelling*, which is the construction of a game narrative through cues in the environment (2011, 6). Deriving from Charles Peirce's semiotics, the philosophy of signs, Fernandez-Vara describes the use of three types of signs. *Icons* imitate signs (e.g. a sound written in text), *symbols* mediate meanings (e.g. a "Danger" sign) and *indices* connect signs directly with physical ideas (e.g. frost indicating freezing temperatures) (2011, 5). These signs can be used by game designers in the game environment to give the player an idea of how to reconstruct what has happened there in their mind, thus creating a narrative for the player (2011, 6). The researcher also discusses how indexical storytelling can rely on remains, where the game world is shaped by traces left behind by previous agents (Fernandez-Vara 2011, 7-8). Indices can also be used to influence the behavior of the player (Fernandez-Vara 2011, 6). Jenkins (2004, 126) brings this up while talking about embedded narratives, describing that information given to the player can be used to create a mental map, based on previously received information. In turn, this lets the player make a hypothesis about the future narrative developments (Jenkins 2004, 126). The researcher also mentions how the player can act upon this information if they suspect that there is danger up ahead (Jenkins 2004, 126). Caracciolo (2022, 36) mentions that most of the backstory in the game *Outer Wilds* (2019) is found through different environmental storytelling elements and by using the game's mechanics – it applies curiosity to drive the player toward exploration in order to find these narrative cues.

Wei (2010, 248-249) introduces new types of embedded narratives, called *horizontal embedding* and *vertical embedding*. The researcher explains how these embeddings can be used in different ways to communicate the narrative to a player. The author describes horizontal embedding in a way where the narration shifts between characters or is told through the environmental storytelling (248). Vertical embedding on the other hand is when there is another level of narration, by having objects such as journals, that are narrated by known characters in the game or by having voice-over narration (Wei 2010, 249).

Meta-narrative is a concept where the creator engages with the audience, creating self-awareness about the narrative construction and the narrator's thoughts, which can lead to self-reflection for the audience (Depboylu 2024, 549). Meta-cinema is described as encouraging the audience to question what they are currently experiencing by being self-aware of the situation causing self-reflection (Depboylu 2024, 550). Meta-cinema creates

a new form of narrative by referring to itself, commenting on the narrative and its own activities. This form of narrative is being used in games like *Alan Wake 2* (2023), where it heightens awareness of the game's fictional structure and evokes reflection about the story's interactive characteristics (Depboylu 2024, 550). Pointon (2015, 10) on the other hand focuses more heavily on the interpretation of the meta-narrative and how it can influence the player psychologically. By bringing a meta-narrative twist to the end of *BioShock* (2007), the game hints that the player has no free will, as they have been following the footsteps of the game's narrative all along. If the player decides not to do as the game says, then there will be no gameplay at all, stopping the narrative progression, but if the player decides to continue, they then become a puppet (Pointon 2015, 11).

When playing a digital game, players can experience a sense of involvement or engagement. This is known as immersion and it occurs when a person feels like they are inside the game world (Murray 2017, 124). According to Cairns, Cox and Nordin (2014, 3), there are different levels of immersion in video games where the lowest level of immersion engages the player to invest time and effort into playing the game. The second level creates attention and emotional involvement, while the third creates presence, as if the player feels they are present within the game world (Cairns, Cox and Nordin 2014, 3).

Kocurek (2018, 4) discusses how players can get immersed in games because people process real life events and fictional stories in similar ways. The author is suggesting that there is an immersive quality in stories that give people the opportunity to forget about themselves and connect with someone else's experiences (2018, 4). However, certain problems with immersion, like games that are too easy or too difficult, can strain peoples grasp on the fictional world (2018, 5). Cairns, Cox and Nordin (2014, 16) supports this by mentioning challenge-based immersion and how it is connected to the players skills and actions in order to do well. Through the use of different storytelling techniques, you can also improve the immersion (Kocurek 2018, 7). This can be done by avoiding over-explaining stories, giving the possibility for human connection and recognition, correctly using multimedia and also by connecting with the audience by integrating immersive and narrative experiences in the game's design (Kocurek 2018, 7).

In their research, Qin, Rau and Salvendy (2009, 117) created a model for measuring player immersion in video games. Their model included challenge and skills, concentration, control, curiosity, comprehension, empathy and familiarity, which are dimensions that can influence the players' immersion. Cairns, Cox and Nordin (2024, 12) also bring up these dimensions, saying that challenge and skills, concentration and control influence the players immersion, while curiosity, comprehension, empathy and familiarity influences the players engagement within the narrative.

Research Question / Purpose

No studies can be found that compare how indexical storytelling and meta-narratives affect players, separately and when combined. Previous research has mostly looked at these narrative techniques separately, but not how a meta-narrative changes the player experience when added to indexical storytelling. This study aims to explore that by looking at how indexical storytelling, with and without a meta-narrative, affects player immersion, narrative interpretation, and self-reflection. By creating a custom-made video game for this purpose and then analyzing player experiences when playing two different versions of the game, this study aims to give more insight into how these narrative strategies influence players. We expect this study to aid game designers when designing narrative focused games.

Methods

During this study, a narrative-driven demo game was created to aid in the data gathering. Data was gathered through interviews after the participants had been playing one of two versions of the demo game. The interview material was then transcribed and analyzed through a thematic analysis.

Design Project

Creation of the artifact

In order to collect data for our research question, a game was developed that combines indexical storytelling and meta-narrative. The game was created over a two-month period in the game engine Unity (Unity Technologies, 2024) and takes place in a 3D environment. The player's point of view is in first person, allowing for direct interaction with the surroundings and a more immersive experience.

The game contains a variety of interactable objects connected to the story that the player can examine to understand the story. At the start of the game, a text is shown on the screen to give the player some context as to who the player character is and the current situation. The player can then explore the environment and interact with the remains to assemble the narrative in the space (Fernandez-Vara 2011, 7-8). To compare the effects of meta-narrative and indexical storytelling, two versions of the game were created. In the first version, the player can examine and interact with objects such as bills, letters and doors. Non-interactive objects such as pizza boxes, wilted plants and antidepressant pills are also placed in the space to provide context. The second version of the game contains the same objects as the first version, with an added narrator's voice when interacting with these objects. The narrator is the player character Sarah, voicing her thoughts as the player interacts with objects in the space.

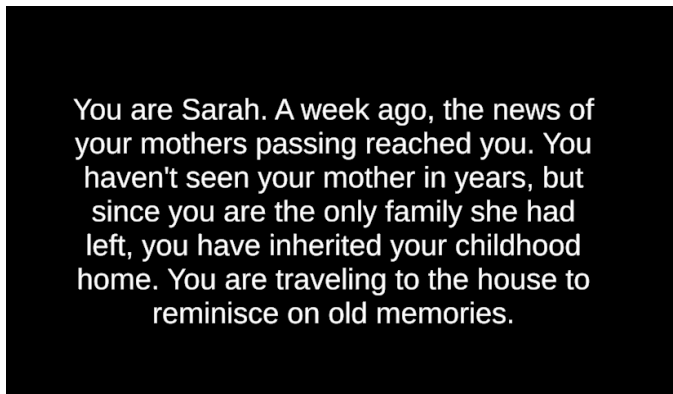
In both versions, there is a locked door that requires a key to open it. The goal of the game is to explore the environment and find the key to Sarah's room. Inside the room, there is a letter addressed to her and when the player interacts with the letter a text appears, explaining that they can now close the game if they feel finished. The player is also given the option to continue exploring if they feel as if they missed anything. This choice was implemented to prevent an abrupt ending and instead allow the player to decide when they are done.

By combining horizontal storytelling (Wei 2010, 248) with indexical storytelling (Fernandez-Vara 2011, 6) in the first version, players are encouraged to interpret the story based on the information presented at the start and the clues left behind in the space by the house's previous owner. The second version combines vertical storytelling (Wei 2010, 249) with indexical storytelling, giving the player more information about past events when interacting with the clues. These clues primarily provide context to the narrative rather than directly guiding player behavior. However, one exception is the door to Sarah's room that has a sign reading "Keep Out". This was implemented to spark the player's curiosity and

motivate them to find the key. During exploration, players may then find additional clues that further help them piece together the narrative.

Context of the game

Sarah is the main character in the game. She has had no contact with her mother in years and recently learned that her mother passed away. The game takes place in an old house that previously belonged to Sarah's mother. Now that the mother is gone, Sarah returns to the house to reminisce about old memories. The player is introduced to the story by an initial backstory text (see Figure 1).



You are Sarah. A week ago, the news of your mothers passing reached you. You haven't seen your mother in years, but since you are the only family she had left, you have inherited your childhood home. You are traveling to the house to reminisce on old memories.

Figure 1: Initial backstory text, introducing the story for the player

By interacting with the environment and looking at the remains (Fernandez-Vara 2011, 7-8) left behind in the house, the player can piece together an understanding of the mother's living situation in Sarah's absence. Only in the second version of the game, is the player given more context as to what Sarah believes has happened in the past. The game does not give opportunity for the player to leave their own traces behind, except for opening doors and having the players explore the area.

The atmosphere of the house is dark and gloomy, with rain hitting the windows and floors creaking as the player walks around. Additionally, sound effects were implemented for door interactions. The layout of the house consists of a hallway, living room, kitchen, bathroom and two bedrooms. Sarah's bedroom is locked behind a door that players can open once they find the key. The key to Sarah's room is hidden in a cookie jar in the kitchen, and when the player interacts with the jar, a sound plays, indicating that they have picked up the key.

Implementation of Indexical Storytelling

When starting the process of writing the story for the game, there was a need to implement indexical storytelling in order to investigate its impact on the players. By creating a flow chart of the whole game, an even amount of indexical storytelling could sufficiently be placed in the game world to make all the rooms interesting to visit. By implementing icons, symbols and indices into the game, the player is supposed to puzzle together different signs to figure out what events they are pointing towards (Fernandez-Vara 2011, 6).

An icon used in the game is a family photo (see Figure 2), and a “Keep Out!” sign was used as a symbol. The majority of the indexical storytelling added to the game was indices.



Figure 2: Family photo from when Sarah was little

An empty plate with cutlery and scattered bills on the table (see Figure 3), antidepressant pill bottles, half-written and crumpled letters (see Figure 4), and dead plants serve as some of the indices. There is no way in steering players to find every clue and assuming they will understand its meaning (Jenkins 2004, 126), which is why a larger number of clues were scattered around the house, some interactable (being able to pick up and look closer at) and some not.

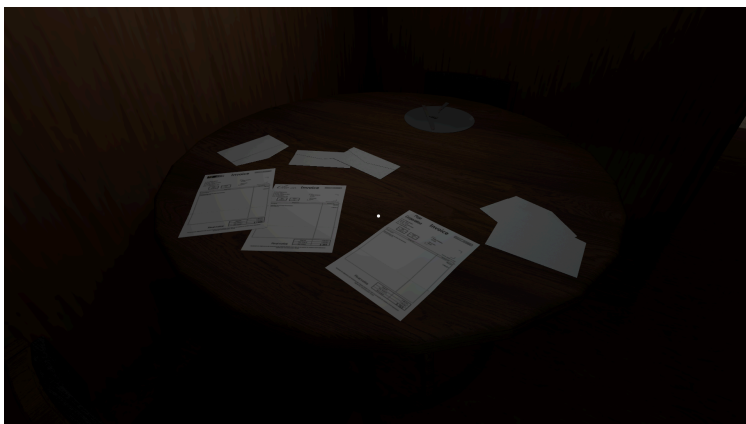


Figure 3: Opened unpaid bills and dirty dishes on table



Figure 4: The mother's bedroom with unfinished and crumpled letters scattered

The items placed in the environment are supposed to give the player the interpretation that the mother in the story has been depressed, eating junk food, having trouble paying her bill, but at the same time she has been saving money for her daughter. The plants are dead, the bed unmade and dishes still standing on the table are also supposed to indicate lack of time and effort to take care of the home.

Implementation of Meta-Narrative

In the second version of the game, where meta-narratives were the main subject for investigation, voice acting was added. The only other difference, other than the voice acting, is that the interactable objects in the other version are not being able to be picked up in this version. The flow chart was used here as well to pace the amount of voice acting that would be needed. The voice lines were placed on specific objects in the environment, activating by interacting with them. The content of the spoken messages varies, but all had the goal to give the player more context to the mother-daughter relationship and/or bring the daughter doubts about who the mother was and her intentions. By giving the player backstory to what kind of relationship the mother and daughter had and letting the player hear the daughter think aloud, the goal is to make players self-reflect on the story, creating their own understanding and opinion of what has happened. Trying to make the player self-reflect can make their interpretation different from other players based on what they have experienced in their own life. An example of a voice line that pushed self-reflection was added to the bathroom shelf (see Figure 5);

I didn't know mom took anti-depressants. She must've realised she was a mess when I moved out... Or did she **become** a mess when I left?



Figure 5: Spilled bottle of antidepressant medicine

By placing doubt in the words of the character, making the character self-reflect, the hope is to make the player self-reflect as well. By letting the player hear the thoughts of the narrator, it can make the player self-aware, which in turn can lead to self-reflection (Depboylu 2024, 549).

By using the narrator's voice, the idea was also to give the player a deeper understanding of what has happened in the past. This was done by adding a phone message (see Figure 6);

Hi mom... I just wanted to tell you I will be stopping by to pick up the last few boxes tomorrow at 4. I don't want any arguments, so I think it's best if you stay out of my way when I am there. It will only take a few minutes and then I'll be out of your way for good. Just wanted to inform you... Well, bye...

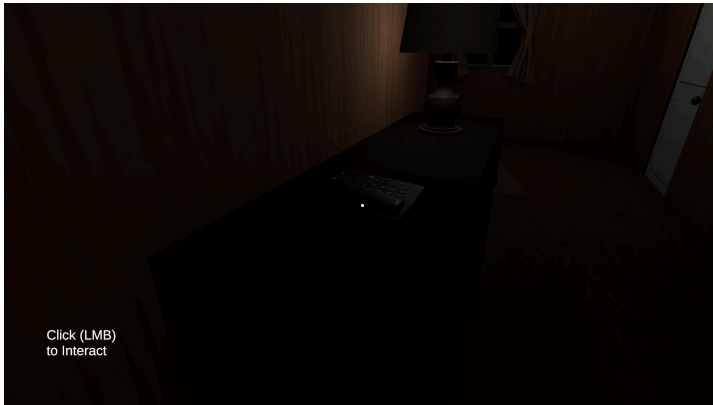


Figure 6: Phone that plays a message for players of the meta-narrative game version.

Since people process fictional stories in a similar way as real-life events, which can contribute to immersion, adding more context to why the mother and daughter grew apart could contribute to the player immersion (Kocurek 2018, 4).

Data Gathering

To study indexical storytelling and meta-narratives, this study created a demo game, consisting of a house where the player gets to experience the narrative by exploring the environment. The demo is divided into two versions, where version 1 has indexical storytelling, and version 2 is almost the same as the first, but also includes a meta-narrative where there is a narrator telling stories while the player is interacting with objects.

This study uses *in depth-interviews*, which is used to examine the participants' experiences of the indexical storytelling and meta-narrative in the demo game (Cote and Raz 2015, 93-4). This interview method allows for more details to be gathered by a smaller group of people, and it is important to point out that it does not allow for general answers over a bigger population.

In this study, 10 people were interviewed individually. All participants were given an individual ID to anonymize their answers, where IDs for players of version 1 starts with V1, and those who played version 2 starts with V2. They were asked questions about their experience of the demo game and the different storytelling elements in it. The interviews were held online over the platform Discord (2015) and the sound was recorded for it to be transcribed afterwards. The interviews lasted for 8-15 minutes.

Participants were recruited through online gaming forums and gaming Discords. The people that were recruited for this study were adults. All participants were contacted personally and the people who had gaming experience and were over 18 years old were asked to participate in the study. The gender distribution was 90%/10% for men versus women. Before the participants played the demo game, everyone was informed of the type of game they were about to play. Before the interviews, the focus of the study and information about how their personal information was going to be handled was explained to the participants. After this, all participants gave verbal consent to participate in the study. The consent was recorded and saved until after this study was published.

The interviews were semi-structured, with a predetermined structure for the questions that were to be asked, but with added room for follow-up questions that felt necessary for clarification or elaboration of answers given (Cote and Raz 2015, 103-4). The predetermined questions asked about how the participant experienced their own immersion in the demo game, how they interpreted its narrative and how it affected their own self-reflection. The questions asked for the two versions of the demo game did not differ in any way other than that there were a few extra questions for participants playing version 2 that specifically asked about the narrator in the game.

Data Analysis

To analyze the gathered data, a thematic analysis was conducted (Braun and Clarke 2006, 86-93). Since this study is based upon previous research, the thematic analysis is theoretical, where prewritten main themes and sub-themes were written down before the analysis began (Braun and Clarke 2006, 83-4). The main themes, *immersion*, *narrative interpretation* and *self-reflection*, focus on the research question of this study. Since this study specifically looks at the participants' views of the two versions of the game in a semantic way (Braun and Clarke 2006, 84), consisting of two different narrative storytelling elements, *meta-narrative* and *indexical storytelling* were appropriate sub-themes to separate what type of storytelling the player was describing. From these sub-themes, more specific codes could be found during the analysis, describing how the different types of storytelling affected the participants' play session. A second phase coding was made to group initial codes together. Some codes that were found did also correlate with previous research, such as *curiosity*, *challenge*, *concentration*, *empathy*, and *familiarity*, which Qin, Rau and Salvendy (2009, 117) use to measure player immersion. The previous code names correlating with these codes were regrouped and renamed to match Qin, Rau and Salvendys' codes.

Indices were mainly used to convey the indexical storytelling in this game. It was encountered by every participant and therefore became a code. Some of the most commonly encountered codes over all main themes were *indices*, *atmosphere*, *voice acting*, *personal reflection* and *character reflection*.

To organize the codes and themes, separate thematic maps (Braun and Clarke 2006, 89-90) were created for both versions of the game (see Appendix A and B). This allows for further

analysis to be made, where differences between the versions can be spotted more easily. In the maps, codes were categorized under the main- and sub themes that participants talked about. The participants gave answers where they described their interpretation of the game and its narrative, their level of immersion and their thoughts. In the thematic map, it is possible to see how the coded answers correlate with each other.

During the creation of the thematic maps, there were some codes that still needed to be clarified. These codes were *sound*, *lighting*, and *horror*, which became categorized as sub-codes under the code *atmosphere*. Additionally, some codes in the analysis of version 1 did not fit in under the sub-theme of indexical storytelling, which led to those codes being directly connected to the main themes.

A few codes were noted in one instance of the transcriptions. These codes were discarded due to lack of connection to the main themes.

Results

In this study, the indexical storytelling version of the game will be called “Version 1” and the meta-narrative version will be called “Version 2”.

The results of the thematic analysis in version 1 suggest that players immersion, narrative interpretation and self-reflection was primarily influenced by indices, curiosity, character reflection and empathy. These codes were also present in version 2, but with the addition of voice acting, personal reflection and familiarity being enhanced, which was not as evident in version 1.

Version 1

Immersion

Several participants described different factors that affected their *immersion*. Participant V12 was asked if they felt immersed or engaged in the game and described being *present* in the game and displayed a *curiosity*;

Yeah, I did. I felt like I was in there. I really wanted to find out what was going to happen next. I felt like I just got abandoned and I'm like, OK, what do I gotta do?

The games *indices* was also making participant V12 feel more *immersion*;

Probably reading through like the different things scattered around, like finding the specific things. Exploring and whatnot. I felt engaged trying to piece together the story through finding those things.

Participant V14 explained that they felt *emotionally involved* by how the building in the game was set up, “giving you eerie vibes”.

Participant V15 described being *engaged* in the game and, when asked if there was anything in the game’s environment that made them feel more engaged with the game and its theme, they mentioned the *atmosphere*, specifically the *lighting*. V15 talked about the lighting as a metaphor for the characters mood, *reflecting over the characters* life;

The lighting. For how many lights there were, it wasn't as bright. So it shows, like she's in a depressive mood. She's not seeing everything for what it is. You know, the main character, Sarah's viewpoint. She's seeing the world more darker.

Participant V15 said that their *immersion* was heightened by the *indices* in the game, describing their *narrative interpretation* of the story through the indexical storytelling. They also gave a *character reflection*, telling how they thought the mother was feeling;

Seeing that bill. The bill was like, oh, so that is like tying in the fact of, yeah, the mom committed suicide because she had crippling debt, depression alone. No idea where the dad is in the story 'cause it only mentions Sarah's mom. And if the dad was in the picture, why would Sarah be inheriting the family home instead of just the dad? So it shows like there's a depressive storyline. Besides the antidepressants, but yeah.

Narrative Interpretation

Both participants V12 and V15 seemed to have a clear vision of their *narrative interpretation*, describing several *indexical storytelling* elements in the environment and how they made them think of what had been happening there before they came there. When asked about who the main character was, participant V12 *reflected over the character* with the help of the *indices* displayed in the game;

I believe Sarah is a kid in this house. I believe that her parents are swamped with issues. You know there's bills everywhere. They're taking antidepressants, and going into what I believe was the parent's room, we saw a bunch of money on the dresser and whatnot and a letter that she, I assume it was the mother or father, whoever a parent, was writing. So you know Sarah is this daughter of these people and she's kind of troubled and it's sort of like a troubled history with the family and all of that.

When asked about what made the story in the game clear, participant V15 mentioned several *indexical storytelling* elements that they thought “add up together”. They described several *indices* in the game that they thought pointed to the fact that the mother killed herself;

The antidepressants, one of the bottles was spilled. The bed was unmade. You can see all the paper that was on the floor and the failed, like starting attempt of writing what I assume is a suicide note that [Sarah] finds on her bed, in a room that was locked with a key that only Sarah would know the place of because she grew up in the house.

Participant V15 also described seeing *indices* in the environment, which contributed to their *narrative interpretation* of the game. While doing this, they also *reflected over the characters' lives*;

The mom was regretful of her choice. I think 'cause I joked, a bit like antidepressant suicide, but the fact there was a letter left. It makes you really think. Plus, the house, the fridge was open, everything was everywhere. The bed was unmade. So it shows that after the death, no one had been there, so the mom was alone, depressed. So it was probably she died via suicide after having her last meal.

Participant V13 displayed a *curiosity* about the *indices* in the game, giving a *narrative interpretation* that something must have happened there;

There is something special that has happened, which makes you wonder, when there is a bit of money and when she starts writing a letter, but stops.

When participant V12 talked about their *narrative interpretation*, they also showed *empathy* for the character's situation, *reflecting* over the fact that the character is “definitely going to have to deal with not having parents, and there's definitely going to be some sort of big issue there with that”. V12 also described *indices*, like “the money being left and you know, kind of like the scattered state of the house”, that made V12 feel like the character had been left behind by the parents, who seemed to have left in a hurry.

Self-Reflection

When talking about the characters' life, participant V11 *personally reflected* over their own life, seeing a *familiarity* between their own life and the character, seeing that they both had lost their mother. When asked about if their experience outside of the game was relevant in understanding the story, they displayed *empathy*, that they could “feel how that little girl is feeling”. V11 thought the letter (*indexical storytelling*) reminded them of their own life and said that “she probably wants answers, just like another wants answers to things you maybe can't get answers to”, describing the *curiosity* to know what is and will stay unknown.

Participant V12 mentioned a connection to the character, *reflecting over the characters* feelings in the story, showing *empathy* for her situation;

I mean, I felt like I was confused as a child would be left in that situation, trying to piece together, finding all the stuff, like why is everybody gone? What happened? What am I supposed to do with the stuff that was left for me? I felt kind of as confused as I imagined Sarah did in that moment or would in that moment.

Version 2

Immersion

Participant V21 said that the narrator (*meta-narrative*) affected their *immersion* and *engagement* and that the contributing factor was the *voice acting*;

The intonation. The method or the tone that they used when speaking the lines, definitely gave a specific set of emotions and kind of set the tone for the story.

V23 explained being *present* when asked about what level of immersion they felt. They also added that they were in “detective mode”, explaining how they “wanted to know more about her story and what was going on”, expressing a *curiosity* for the game.

The *atmosphere* made participant V24 more *engaged* with the game and its theme, both through *sound* and *lighting*;

...the lighting. Just because it was darker, you know it was more of a sadder tone. The ambient sounds of the rain, it's just rain signifies like a sad day I guess.

V24 also thought that the *atmosphere's lighting* indicated that the game was “either going to be a horror game or it's going to be a storytelling game”.

Narrative Interpretation

V21 mentioned that, from the beginning of the game, they felt “emotionally tied to the story” (*emotionally involved*) and were *curious* to know more about the narrator, asking “why is she so melancholy?”. When asked about what made the story clear for them, V21 mentioned “the way things are described” and “the voice acting”. They also mentioned that the narrator's voice gave them “a lot of ideas that [the voice actor] was kind of melancholy”. The narrators presence affected their *narrative interpretation* and made it clearer, even though the *indices* also played a part in it;

...without the voice, the different clues would've been interesting, but you wouldn't have had as much tie-in to what they were.

Participant V23 described a *curiosity* about the game and gave their *narrative interpretation* by explaining aspects coming from both the *indexical storytelling* and the *meta-narrative*;

... it kind of felt like some sort of mystery or like, I need to unravel more. But that's what I got out of it so far. You know, obviously she had some childhood problems. Her mom was on antidepressants. She took her college money. That kind of stuff. So I wanted to see where it goes. What's next?

Participant V23 also thought that the narrative became clearer with the *voice acting*;

I think the narrative, the voice overs were probably the most helpful things in making everything, you know they tied everything together, obviously.

Self-Reflection

One participant, V22, *reflected over the characters* feelings while hearing the *meta-narrative* and seeing the *indices* in the game, interpreting the narrator as feeling guilty when they heard the *voice acting*;

.. the first note I read was a very strong undertone of someone being very guilty of a situation. The bills, you know, like the college fund stuff. I felt that very strongly.

Participant V22 also displayed a *personal reflection*, explaining how they saw a *familiarity* and felt *empathy* through their *narrative interpretation*;

...the whole reason why the thing with the guilt hits me pretty hard is because I have friends that are in a similar situation with their relationship which, yeah, obviously I just reflected on my real world.

A *personal reflection* was also shown by participant V21. They described a part of the *meta-narrative* that created a *familiarity*, which V21 could relate to;

The moment where you click on the door and the narrator says that she used to be locked in there until she calmed down. My parents did that to me for a little while, so it was very connecting.

Participant V24 expressed a feeling of *familiarity* when describing what relationship the character and her mother had, explaining how they related to it by saying they “don't have a very good view of my parents and this is how I would think about them if they were to do something like what her mom did”. Participant V24 also described a *personal reflection* by saying that they could understand how other people could relate to the character;

I mean, we've all been in debt before. We've all had something that we got to take care of, but we couldn't. I can understand how it might be relatable to other people. You know, just letting someone else borrow money from you and not expecting it to come back to you. I think that's something that happens a lot as well.

Participant V25 showed *empathy* when saying that “it felt like you stood in her shoes” while *personally reflecting* how it would be to be in the character’s situation. They explained that the characters “mother had passed away and, well, it would be really sad if you had gone the same path yourself”. Participant V25 also said that they felt “*emotionally involved and present* in the game” through their *narrative interpretation*;

I haven’t lost any family members, but depression and stuff like that, that I can personally relate to. So, already from the start I felt a connection.

While describing the parts of the *indexical storytelling* and *meta-narrative*, participant V24 *personally reflected* over the narrative and describes being *immersed* by seeing connections between real life and the game;

When I went into her mom’s room and found the money, it’s like it’s somewhat relatable and you can understand, a struggling mom trying to support her child. That’s like, a relatable thing that happens in real life, and that’s where you can find a lot of immersion.

Discussion

Based on the results, it is evident that both versions of the game have its strengths and weaknesses when it comes to how their narrative structures affect immersion, narrative interpretation and self-reflection.

Immersion

The participants' immersion was similar between the two versions, where players of version 1 experienced it through indexical storytelling and atmosphere, and players of version 2 experienced it through indexical storytelling, meta-narrative and atmosphere.

The participants that played version 1 mostly talked about what they found out about the story through exploring the indexical storytelling. Some described a curiosity about the exploration, contributing to the immersion. The participants that played version 2 experienced a more controlled narrative, giving them more context to the story. They talked a lot about what they saw and heard. They often talked about both at the same time, considering that their interactions with some items triggered the voice acting. Some of the participants that played version 2 also did say that they felt the combination of the indexical storytelling and the meta-narrative contributed more to the immersion when together, and said that if only one of the narrative structures would have been present, it would not have been as immersive. This can be supported by Kocurek (2018, 7), who explains that different storytelling techniques can improve immersion, with one thing being to provide the player with a human connection and recognition. By utilizing the voice acting, the players could feel a human connection to the character, making them more immersed.

Some participants of version 2 felt that the voice acting contributed to the immersion through the intonation and what was said. It made them feel empathy and familiarity with the character, which are two of the dimensions mentioned by Qin, Rau and Salvendy (2009, 117) as part of their model for measuring immersion, whereas empathy and familiarity influences the player's engagement within the narrative (Cairns, Cox and Nordin 2024, 12).

Both versions of the game had the exact same atmosphere and showed that the participants were immersed by it in two ways. Players of both versions did mention that they thought it was going to be a horror game when they talked about the atmosphere, with the lighting being the biggest contributor for setting the mood in the game. This indicates that the participants could place themselves in the game and become immersed in the game world through the environmental storytelling. This can be supported by Jenkins (2004, 123), who speaks about how designers utilize environmental storytelling to make players immersed by making them associate the narrative with pre-existing information (such as darkness symbolizing danger) through the narrative. Although this is not connected specifically to either the indexical storytelling or the meta-narrative in this case, it is worth mentioning since lighting and sounds are elements that can be used in indexical storytelling, for example through the use of smoke indicating a fire (Fernandez-Vara 2011, 5).

The biggest difference in immersion between the two versions was that version 2 contributed to a wider variety of codes. This indicates that a broader narrative structure, compiled of

several ways of telling the story, could contribute to the possibility of experiencing immersion through several sources. This is reinforced by what has previously been mentioned by Koucrek (2018,7), that different storytelling techniques can improve immersion through human connection and recognition, as provided by the meta-narrative in version 2.

Narrative interpretation

There were one participant from version 1 and two from version 2 that did mention that they thought the atmosphere was symbolizing the characters mood or a sadder tone in general. The fact that two participants from version 2 felt this way could have been a coincidence, since the atmosphere is not necessarily connected to the indexical storytelling or the meta-narrative. Although, it can be argued that the participants of version 2 could have been more self-aware because of the meta-narrative (Depboylu 2024, 549), making them reflect more on the surroundings' symbolisms.

Version 1 told the narrative through indexical storytelling, giving the player only visible clues to what had happened. This gave the players freedom to interpret the narrative in some ways, creating their own understanding without being directed towards a clear narrative (Fernandez-Vara 2011, 6). The interpretations of the participants in version 1 differed more than the ones of version 2, where the narrative was more clearly defined through the meta-narratives voice acting. This demonstrates that different types of narrative structures give the players different levels of interpretation freedom, where more defined narratives contribute to less individual interpretation and vice versa. Both options are suitable depending on which level of narrative interpretation freedom you want to give the player and how you want to convey the narrative. Indexical storytelling provides the player with an idea of how they can imagine what has happened in their head (Fernandez-Vara 2011, 6), while meta-narratives engage the player by creating self-awareness about the narrative construction and the thoughts of the narrator (Depboylu 2024, 549).

Some participants who played version 1, who rarely or never played narrative-driven games, did not read or understand the initial backstory text that all participants were shown before the game started. This made them go a lot on gut feeling about who the character was and what the narrative was about. The indexical storytelling did however give them pointers, leading them in directions similar to what the design was trying to tell them. This was not as evident in participants who played version 2, who mostly described the narrative thoroughly. This most likely was due to the narration giving the participants the opportunity to create a better picture of the story, even if they did not read the initial backstory text.

Self-reflection

The participants in version 1 mostly reflected about the characters in the story through the indices left behind by the main character's mother. They also reflected over the main character's current situation. By seeing certain indices, they could reflect over what feelings the character must have felt, like when participant V12 interpreted that the situation and the state of the house must have been confusing for Sarah. The indices made it possible for the player to reconstruct a story of events that has happened in the game in their own mind,

making the player experience empathy and familiarity with the character, which in turn contributed to their immersion (Fernandez-Vara 2011, 6; Qin, Rau and Salvendy 2009, 117). These findings are also in line with what Jenkins (2004, 128) says about embedded narratives.

There was only one instance of personal reflection in version 1, which is an interesting contrast to look at between the versions. In version 2, the participants showed multiple instances of both character reflection and personal reflection, but when character reflections were made, they often were correlated to a personal reflection. The meta-narrative was written to influence the players self-reflection, and if this was done successfully, this could be the result of that, since meta-narratives create self-awareness for the players, making them self-reflect more while playing than those who played version 1 (Depboylu 2024, 549).

In version 2, participants reflected about the character, but also explained how they could see similarities between their own life and hers and felt more empathy for the character based on their own life experiences. This can be supported by the fact that meta-narratives can create self-awareness for the player and result in self-reflection (Depboylu 2024, 549). How the participants explained feeling empathy and familiarity can also increase the engagement, leading to immersion, which was noted by a participant in version 2 (Cairns, Cox and Nordin 2024, 12). This is supported by Ryan (2001, 149), who explains how internal thoughts from a fictional character can resonate with people and connect with them emotionally in order to create empathy.

Beside the self-reflection, participants did also mention real-life social and psychological situations in relation to the theme that the game was trying to convey. One participant mentioned the mothers debt and described it as mirroring real-life troubles to pay bills and struggling to support a family, and another participant was reminded of mental illness and economic pressure by the game. This is something that Murray (2017, 129) brings up, describing how the boundaries between imaginary and real are being blurred with, for example, the digital world's realistic qualities.

Limitations

This study looked at how players' immersion, narrative interpretation and self-reflection was affected by indexical storytelling and meta-narratives, but there was one unexpected aspect that did affect several players beside these. That was the atmosphere, which made players feel immersed and reflect over the characters feelings.

After this study was conducted, it has become evident that the answers given during interviews connected to the player experience could be somewhat misleading. The reason for this is that there is no guarantee that the participants answered what they felt and thought during the play session. It could be that they, when asked about a specific topic, gave it more thought during the interview than they did during the play session. This is something to consider when choosing methods for future research, where other methods may be more suited for this type of study.

Another aspect that could affect the end results is the participant pool, consisting of only 10 participants. Despite the number of participants, the findings that were discovered are evident, with several participants supporting each other.

The participants recruited for this study came from a wide variety of countries across Europe and the United States. This could have affected the results due to the fact that different cultures can have different views of the games narrative themes, such as depression.

Some participants said that the game was too short and that they had a hard time getting immersed on a deeper level. For them to further immerse themselves and better understand the narrative, a longer game could be required. This could in turn lead to more detailed results.

For this study, the players did only experience meta-narratives through voice acting. There are several ways to convey meta-narratives which are not explored in this study. To get a broader view of how different types of meta-narratives affect players, other forms of meta-narratives could have been explored.

Conclusions

The results indicate that the meta-narrative played a part in influencing the participants self-reflection. Participants that played the version 2 expressed their character and personal reflections in more detail because of the added context given to them about the character and previous events in the narrative. They experienced aspects like familiarity, empathy and curiosity in a larger number than what participants of version 1 did.

The immersion was similar in both versions, as the participants felt engaged through curiosity when exploring the environment and looking at indices in the space, and then trying to piece this together to form a narrative. The atmosphere also played a part in the participants' immersion through the sounds and lighting in both game versions. While the first version included players feeling present, emotionally involved, concentrated and curious, the second version had immersion through the narration of the voice actor, and the context added through the narration also created character reflection and curiosity. This shows that voice acting can affect the immersion of players within the narrative.

As for the narrative interpretation, the participants indicated that the cues left through the indexical storytelling was the main factor for understanding the narrative. The meta-narrator was mostly used to add a deeper context to what had happened in the story and was contributing to players reflecting over the narrative.

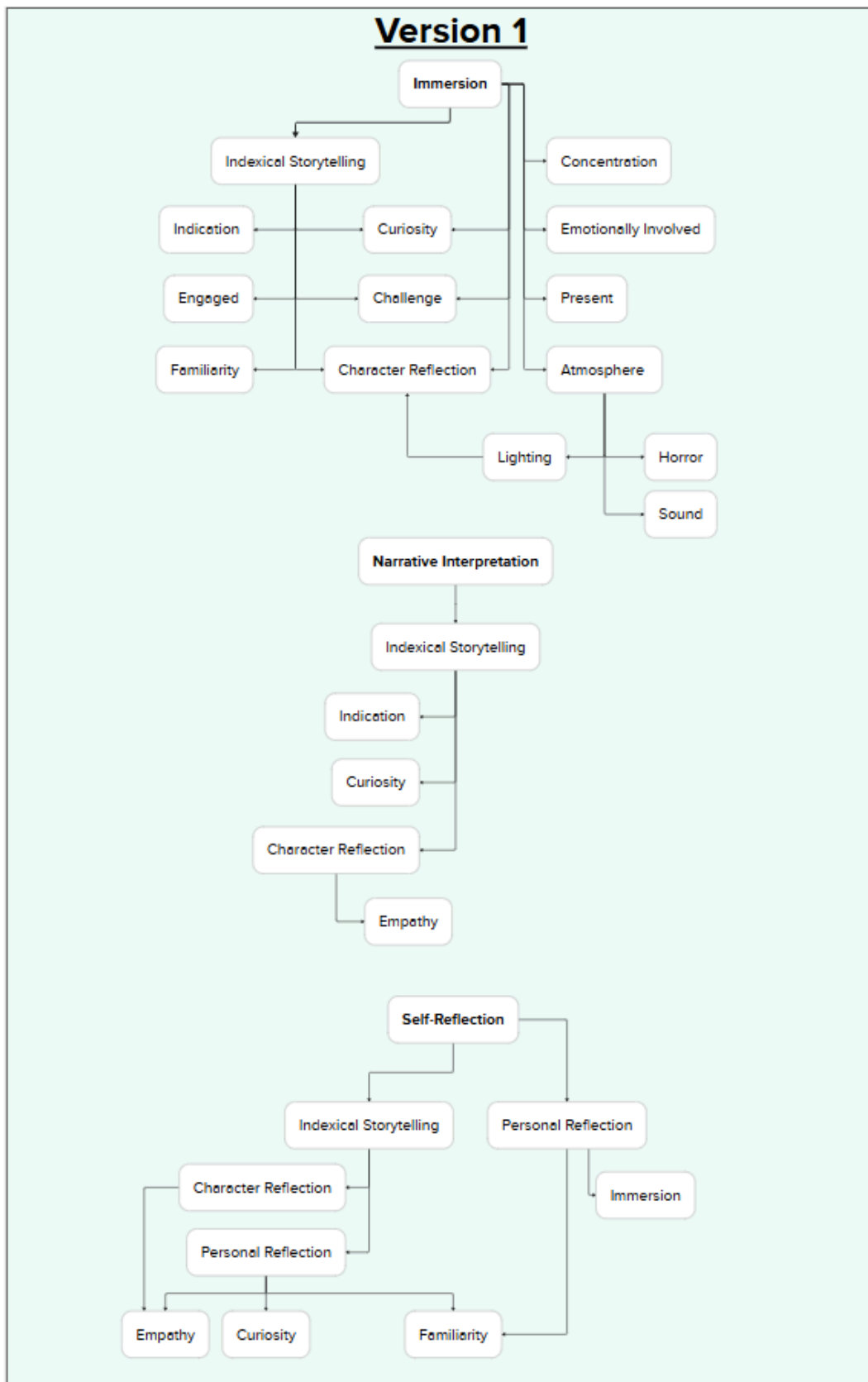
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Appendix

A



B

