Crafting Fear:
Theories of Horror in Game Design

Eduardo J. Reyes
Master's Degree in Video Game Design and Development
Universitat Oberta De Catalunya
Mr. Joan J. Pons López
Mr. Joan Arnedo Moreno
15th February, 2024

1. Introduction

1.1. Abstract

Why do humans crave fear in a simulated experience? What are those mechanisms previously designed that can tick those parts of the brain and make it experience those specific emotions?

The truth is that it is that **“fear” by itself is a complicated matter**. A brain understanding or trying to explain how a brain works will always be a complex matter. And the fact that we’re the universe experiencing itself is even more convoluted. But let’s get back to the ground (And to the theme of this thesis) and think on: **Why does a game inspire fear in us?**

Lots of studies, books, articles and blog posts have explored this theme but, due to their nature of mostly focusing on the aesthetic part of the game, they barely show the surface of the iceberg. What about the mechanics? **Can a mechanic inspire fear by itself?** Probably not. Then what about dynamics? Can these inspire fear in the player?

Fear itself is a feeling, a part of the aesthetic part of a game, so designing towards **this result will always be a tricky process**.

Keywords: Game, Horror, Level, Design, Fear, Survival, Mechanics, Dynamics, Tension, MDA, Framework.

1.2. Acknowledgements

I extend my heartfelt gratitude to all those who contributed to the completion of this thesis.

Firstly, I am immensely thankful to Paula Soler Torres and Davide Turotti for their continuous feedback, guidance during challenging moments, and late-night collaboration on the technical demo development. Secondly, I acknowledge the rest of the Slumber Party Games team, with special mention to Demir Danışman for innovative ideas and Aina Serra for her exceptional artistic contributions. Thirdly, I commend my tutor, Joan Josep Pons Lopez, for providing consistent guidance throughout the thesis and maintaining swift communication across all days of the week. Finally, my sincere thanks go to the GDevelop team for addressing all my technical questions, no matter how specific or challenging they were.

1.3. Links

Crafting Fear: Theories of Horror in Game Design is free and available to read for any person and can be read or downloaded in the following websites:

- Google Drive A
- Google Drive B

1.4. Preface

In the vast landscape of video game development**, the horror genre stands as a prominent domain**, both in terms of the sheer volume of existing games and the substantial player base it commands. Year after year, the appetite of horror enthusiasts for increasingly immersive experiences continues to grow.

However, despite the abundance of material available in this genre, achieving the elusive goal of **invoking genuine fear** and suspense in players remains a formidable **challenge for game developers.** While existing resources provide valuable insights into the visual and auditory elements of horror game design, **not much is said about the mechanics and dynamics** unique to the horror genre.

"Crafting Fear: Theories of Horror in Game Design" embarks on a journey to bridge this conspicuous gap by adopting the **MDA Framework**, as postulated by Robin Hunicke, Marc LeBlanc, and Robert Zubek in 2004. Central to the MDA Framework is the principle that successful game design necessitates **the prioritization of mechanics and dynamics** before delving into aesthetics.

This document aims to demystify the intricate process of crafting horror experiences, **offering a definitive blueprint for game designers** engaged in the nuanced task of creating horror games. The research within this thesis involves a comprehensive examination and synthesis of existing resources, encompassing documentation, blogs, videos, and **the development of a prototype computer game to validate the theories stated.**

While the prevailing discourse within the gaming community often fixates on the aesthetic aspects of horror games, this thesis distinguishes itself by placing a primary emphasis on the mechanics and dynamics that conspire to elicit fear in players. By doing so, it seeks to provide an invaluable resource for those aspiring to master the art of horror game design, and ultimately enhance the immersive and spine-tingling experiences of horror game enthusiasts.

1.5. Table of Contents

1.6. Figures and tables

1.7. Glossary

MDA Framework: The MDA (Mechanics, Dynamics, Aesthetics) framework is a game design framework that provides a structured approach to analyzing and designing games. (Hunicke et al., 2004, 1)

Mechanics: Mechanics are the fundamental rules and components of a game. They encompass everything from the player's actions and interactions with the game world to the rules that govern those interactions. Mechanics define the "what" of a game, including character movement, combat systems, resource management, and more.

Dynamics: Dynamics refer to the emergent behaviors and interactions that result from the game's mechanics in action. They describe how the game evolves over time and how player choices and actions lead to different outcomes. Dynamics encompass the "how" of a game, highlighting the player experience, strategic depth, and the flow of gameplay.

Aesthetics: Aesthetics in the MDA framework represent the emotional responses, experiences, and enjoyment that players derive from a game. Aesthetics are the "why" of a game, focusing on the overall feel and impact of the gameplay. They include aspects like immersion, challenge, narrative engagement, and the emotional reactions a game elicits from players.

Genre (Of a video game): informal classification that groups games together based on shared features, gameplay mechanics rather than visual thematic elements. These shared characteristics help players identify the type of experience they can expect from a game. (Apperley, 2006, 2)

2. Theoretical Framework

As initially outlined in this document, **a conspicuous deficiency exists** in the documentation regarding organized information **concerning the mechanics and dynamics** that can heighten the **horror experience** within the genre of video games. Although sporadic concepts, such as the emphasis on resource management in survival horror (Bycer, 2021, 22), are evident, they demand a more thorough and granular exploration.

This absence of a comprehensive framework for understanding the intricacies of horror game design presents a fundamental problem for game designers.

Before diving into the exploration of the existing material in the field, it is imperative to **establish clear and precise definitions** regarding fear, and the genre itself.

2.1. Psychological definitions of Fear

If we follow the *Two-factor theory of emotion* by Stanley Schachter and Jerome E. Singer, fear is derived by two determinants: The **psychological arousal** and the **cognitive label**. According to the theory, when an emotion is felt, a physiological arousal occurs and the person uses the immediate environment to search for emotional cues to label the physiological arousal. (Schachter & Singer, 1962, 3)

This can sometimes cause misinterpretations of emotions based on the body's physiological state. When the brain does not know why it feels an emotion it relies on external stimulation for cues on how to label the emotion (Cook, 2007). Meaning that sometimes **fear** stems from real threats, but it **can also originate from imagined dangers or experiences.** (Fritcher, 2023)

Interestingly, we can find classifications depending on the type of fear. The "*Feararchy*", defined by Karl Albrecht poses an interesting differentiation:

- **Extinction**: the fear of annihilation, of ceasing to exist. This is a more fundamental way to express it than just "fear of death." The idea of no longer being arouses a

primary existential anxiety in all normal humans. Consider that panicky feeling you get when you look over the edge of a high building.

- **Mutilation**: the fear of losing any part of our precious bodily structure; the thought of having our body's boundaries invaded, or of losing the integrity of any organ, body part, or natural function. Anxiety about animals, such as bugs, spiders, snakes, and other creepy things arises from fear of mutilation.

- **Loss of Autonomy**: the fear of being immobilised, paralyzed, restricted, enveloped, overwhelmed, entrapped, imprisoned, smothered, or otherwise controlled by circumstances beyond our control. In physical form, it's commonly known as claustrophobia, but it also extends to our social interactions and relationships.

- **Separation**: the fear of abandonment, rejection, and loss of connectedness; of becoming a non-person—not wanted, respected, or valued by anyone else. The "silent treatment," when imposed by a group, can have a devastating effect on its target.

- **Ego-death:** the fear of humiliation, shame, or any other mechanism of profound self-disapproval that threatens the loss of integrity of the self; the fear of the shattering or disintegration of one's constructed sense of lovability, capability, and worthiness.

(Albrecht, 2012)

Evolutionary psychologists (Prokop, 2021, 2) have proposed that the human emotion of **fear primarily developed in response to ancient threats**, such as certain animals (snakes, spiders, rats), heights, storms, darkness, blood, strangers, and the potential for separation or leaving the safety of one's home.

The development of **common human fears seems to coincide with the period when the corresponding dangers might be encountered.** For instance, fears of heights and strangers tend to emerge in infants at around 6 months of age when they start crawling away from their caregivers, increasing the risk of falls or potential abductions. The heightened risk infants face from strangers has been documented in both nonhuman primates and modern humans. (2021)

At the age of 2 years, as infants become more active in their exploration, fears of animals and darkness may develop. Humans have limited night vision, making them more vulnerable to predators when their visual capacity is reduced. **Fear of the dark** may restrict infant mobility, reducing their vulnerability to potential threats. As children grow and start to venture away from their home base, agoraphobia, the **fear of being in crowded or public places** where escape is difficult, may develop. The intensity of these fears in children often decreases with age as they become more physically and emotionally independent from their parents.(2021)

Figure 01: Example of unsettling image appealing both fear of the dark and fear of strangers

Source

In light of the specialized expertise inherent in this work, the author's position aligns with the **acceptance of the established definitions**, rather than asserting them. This approach maintains an objective and unbiased perspective, ensuring the definitions' consistency and universal applicability through the document.

2.2. Fear definition in video games and other media

It has been noted that horror by itself is **not a mechanical descriptor of game design** in the same way like “platformer” or “roguelike” can be, and it is more akin to a philosophy or theme that can be applied to any type of game. (Bycer, 2021, 20)

However, it is essential to acknowledge the **possible reductionism in such a perspective.** While it is correct to mention that horror, in isolation, can permeate to other gameplay styles as a thematic element, it is equally valid to state that other genres can also serve to diversify and give contrast into another set of mechanics.

As such, while horror's **adaptability across genres is undeniable**, it should not be dismissed as merely a philosophical or thematic overlay, rather it should prompt a fundamental question regarding why this unique and intricate set of mechanics gives rise to the desired emotional and experiential outcomes. The emphasis should be on **understanding the underlying mechanisms that evoke fear and suspense in players**, thereby elevating horror game design beyond surface-level thematic considerations.

This focus can often be found within the sub-genre of **survival-horror**. (Bycer, 2021, 20) In this context, it becomes evident that the emphasis is placed on elements such as **resource management** and the player’s state of unease at any given moment, avoiding positioning said player in a position of power. This definition, thus, serves as a prime example of **how a deliberate** selection and orchestration of **game mechanics can engender fear**, suspension and therefore immersion in the player.

It is essential to consider noteworthy concepts such as the **fear of the unknown** as a driving force within the horror genre (Bycer, 2018). The element of uncertainty and the uncharted territories of fear can significantly impact the player's experience. Moreover, the **careful positioning of patterns in level design**, and the introduction of a variety of these patterns, can be pivotal in evoking and sustaining these emotions in players. These concepts are integral to establishing initial theories and subsequently deconstructing them to uncover the core principles and mechanics that underlie effective horror game design.

A significant portion of the discourse surrounding **what makes a game scary**, and the attempt to comprehend the nature of fear and horror in video games, has its **roots in film** techniques. This influence is likely **responsible for the prevailing focus on aesthetics** in discussions related to horror in gaming, as film has historically emphasized the visual and visceral aspects of horror.

One notable perspective is articulated by Noël Carroll in his web blog *The Philosophy of Horror*. According to Carroll, **horror** is a complex interplay of techniques that evoke fear and disgust. The **fear** component is elicited through the presence and **threat of a monstrous entity**, while the element of **disgust arises from the interstitial design** of the monster itself or the horrific narrative or imagery associated with it. (Carroll, 2018)

The uncanny can be argued to appeal to the element of disgust as defined by Noël Carroll. While Carroll's concepts initially associate disgust with the design of the monster or horrific imagery or narrative, it can extend to elements that provoke discomfort and unease in the audience. In works like The *Shining* or video games like *Mothered*, **liminal spaces and uncanny experiences contribute to the overall atmosphere of horror**. These elements may function independently of traditional monsters, and it's possible to perceive these elements as the "monster" in the narrative.

For example, in *The Shining*, **the hotel**, instead of Jack Torrance, could be seen as the **source of horror**, with its malevolent and supernatural characteristics. (Kubrick, 1980)

Figure 02: Liminal space from The Shining

In *Mothered*, the presented narrative, the **player's own actions** and the artificial nature of the environment due to the player's condition of being an artificial being themselves, can be equally unsettling. This challenges the conventional notion of the monster as an external threat and suggests that **the player themselves may embody the role of the monster** within the game world. (Gavin, 2021)

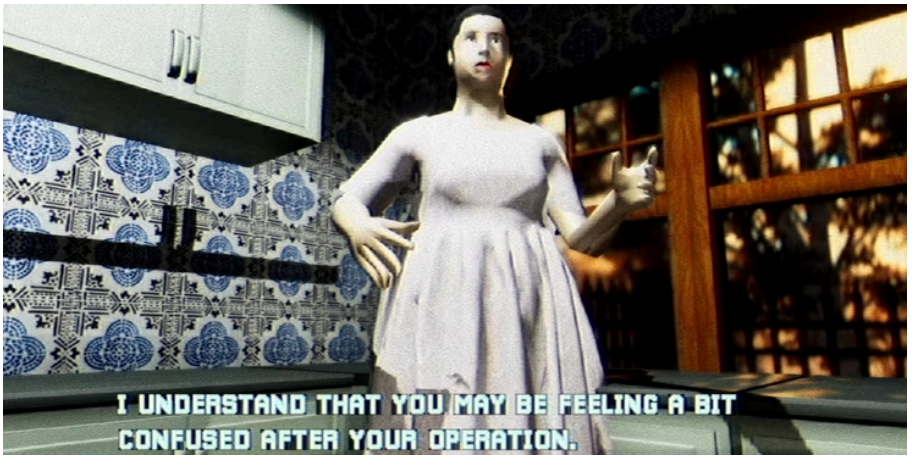


Figure 03: Reality seen from the perspective of the player, which is the monster.

In conclusion, **it is evident that patterns exist** regarding what evokes fear in humans in the context of video games. However, it's important to recognize that **patterns derived from other forms of media**, such as films, **may have limitations** when applied to the unique interactive space of video games. While films rely on visual and narrative techniques, video games have additional tools at their disposal.

Video games have the capacity to design mechanics, dynamics, and level environments that are specifically tailored to induce fear in players. These **interactive elements allow for a more immersive and personalized experience** that can be distinct from what is found in films. This underscores the need to explore the potential of game design, dynamics, and level construction as unique contributors to the horror genre, offering new dimensions of fear that go beyond what traditional media can achieve.

In essence, video games have the ability to craft fear in a way that is both distinct and promising, making them a captivating and innovative medium for the horror genre.

2.3. Historic introduction

It is essential to clarify that the following games listed in this subsection are not an exhaustive account of all horror games. Instead, it **highlights** those pivotal titles that introduced **significant mechanical and dynamical advancements**, shaping the course of the genre.

2.3.1. 1980s

The exploration begins in the 1980s, an era that witnessed the emergence of games that laid the foundation for the spine-tingling experiences we know today. These pioneering titles not only offered players a taste of fear but also introduced innovative mechanics that would come to define the horror genre.

3D Monster Maze

Considered to be the very **first horror game** in history, *3D Monster Maze* was developed for the *Sinclair ZX81*, introducing players to the concept of **navigating** a labyrinthine environment **while being pursued** by a relentless, unseen monster. The game's core mechanics revolved around movement with intention of escape, and evasion, setting the stage for the horror genre's future. (Evans & Greye, 1981)

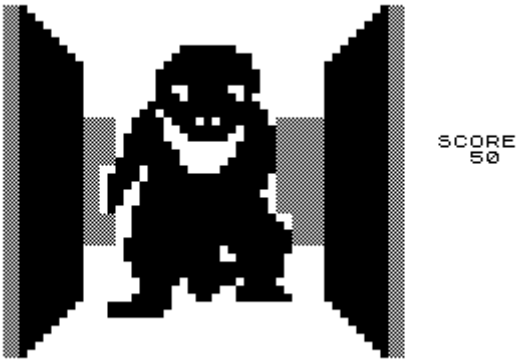


Figure 04: The monster

Halloween

Atari's *Halloween*, (Martin & Barber, 1983) introduced a similar set of mechanics that drive forward the genre. In this game, you assume the role of a babysitter tasked with l**ocating and escorting children to safety** within the house. The home is divided into two floors and two distinct sides, interconnected by doors. Children typically follow the bottom of the floor they're on, and by pressing a button, you can initiate their following. (Vice, 2023)

However, the game adds a twist to the equation, players are kept on their toes by **the looming threat of Michael Myers,** complete with his iconic theme music. Michael's unpredictable appearances and choice of direction when he emerges generate an atmosphere of intense uncertainty. While Michael primarily targets children if they are in the same room, players often find themselves narrowly avoiding him and ensuring the safety of all the children at the same time. The tension escalates as Michael Myers grows progressively faster with every fifth child saved, adding an extra layer of challenge and fear to the gameplay.

Figure 05: Michael Myers chasing the player

Sweet Home

Towards the end of the 1980s, one game that distinguished itself from the rest was *Sweet Home* (Fujiwara, 1989). The game's story revolved around a film crew exploring a haunted mansion, but things take a dark turn as they become trapped and must confront the mansion's supernatural horrors.

Mechanically, *Sweet Home* was groundbreaking for its time. It was a **horror role-playing game** (RPG) where each character possessed **unique items and abilities** that were crucial for solving puzzles throughout the game. What set it apart was the introduction of **permadeath**; if a character died in battle, they were gone for good. This mechanic significantly impacted the game's **multiple endings,** providing players with a sense of consequence for their choices. "Sweet Home" also incorporated **quicktime events**, which predated their widespread use in many modern games.

The game's storyline was notably darker than its predecessors, dealing with themes of suicide and child murder, contributing to its reputation as one of the pioneering horror games in the RPG genre.

Figure 06: Sweet Home's gameplay

To conclude, in the decade of the 1980s, the horror genre in video games didn't see much more **significant mechanical advancements**. Several factors contributed to this, including possible technological limitations of the gaming systems and a prevailing focus on delivering action-arcade experiences rather than in-depth horror gameplay.

With the exception of *Sweet Home*, the horror genre in the 1980s was characterized by **simpler** and less immersive gameplay compared to later decades.

2.3.2. 1990s

The 1990s cemented the pillars of the genre of horror games with the release of *Alone in the Dark* (Raynal, 1992), a title that still stands as a profound landmark in the evolution of the genre. Drawing inspiration from literary masters such as H.P. Lovecraft and Edgar Allan Poe, this game ventured into the uncharted territory of **3D horror**, setting new standards for interactive fear.

Alone In The Dark

Alone in the Dark is a **3D survival horror game** where players must confront supernatural forces and unravel mysteries in a sinister, haunted mansion. The combination of the game's mechanics were instrumental in crafting a terrifying experience.

Fixed camera angles, allowed developers to circumvent technical constraints of the time. This decision had a profound impact, fostering a sense of claustrophobia and unease as players navigated the corridors of the mansion. The **limited perspective** combined with **tank-control movement**, intensified the anxiety, taking power away from the player and making each turn and doorway a potential danger. A **limited inventory** where the total amount of items were restricted by weight. This mechanic required thoughtful decision-making and amplified the tension, as players had to determine which items were essential for survival. Notably, it added **simple puzzles** to its level design. These served as both obstacles and change of rhythm in the level design. These puzzles not only engaged players intellectually but also contributed to the overall atmosphere of dread and mystery.

Figure 07: Alone In The Dark's claustrophobic environments

Alone in the Dark served as a harbinger of the horror genre's evolution into the realm of 3D, paving the way for future titles to explore the dimensions of fear in increasingly immersive ways.

Resident Evil 1 and 2

Resident Evil (Mikami, 1996) took the horror genre to new heights by building and perfecting upon the concept of survival horror.

It further developed the horror genre by introducing mechanics such as **multiple characters** (In *Resident Evil* 2), featuring two distinct playable characters who, while exploring the same environments, embarked on unique storylines. Each character had **gameplay variations** of their own set of weapons, resources, and encountered enemies and bosses, which were specific to their story.

Figure 08: Mister X was found later in game when playing as Leon instead of Claire

In order to manage the saving mechanics, the game introduced **safe rooms** where players could seek refuge and save their progress, a process limited by the availability of **ink ribbons**. This deliberate design choice compelled players to make crucial decisions regarding when and where to save their progress, thereby contributing to the overall suspense of the game.

In *Resident Evil*, players were **immobilized when firing** their weapons, and the zombies, although slow-moving, continued to **advance without pause**. The game intentionally **obscured crucial information**, such as the **health** of both enemies and players. Zombies would frequently rise from the ground, surprising players who had thought they were defeated, and could easily grab inattentive individuals.

Player's **health** information could only be checked in the **inventory menu**, and the information provided was **intentionally imprecise**. Players might not have realized it, but in the game, "Fine" denoted health between 60% and 100%, "Yellow Caution" signified health between 30% and 59%, "Orange Caution" indicated health between 15% and 29%, and "Danger" meant health was between 1% and 14% (Health | Resident Evil Wiki | Fandom, n.d.). The exact amount of life attributed to each zombie remains a subject of ongoing debate, with speculation that it was deliberately set within a specific range.

Figure 09: Resident Evil never gave a number or a percentage regarding the player's health points

As an honorable mention, *Resident Evil* transcended the gaming world, inspiring a multitude of films and media. It played a pivotal role in shaping the zombie genre, with movies like *28 Days Later* (Boyle, 2002), and comics like *The Walking Dead* (Kirkman & Moore, 2004) drawing inspiration from its terrifying atmosphere. The success of the game led to a series of sequels, expanding the franchise's reach and establishing it as a cornerstone of horror gaming.

Silent Hill

On the other side of the horror spectrum, Konami's Silent Hill (Toyama, 1999) offered a radically different approach, emphasizing psychological and emotional horror.

Key distinctions from its counterparts included the player being an **average protagonist** not a highly skilled or trained individual. This approach heightened the sense of vulnerability, as the protagonist **struggled to handle firearm**s and became **audibly fatigued** during intense moments. It also featured real-time rendering and **limited vision** by using fog and darkness effectively in order to conceal the limitations of the game's graphics, creating a disorienting and eerie atmosphere.

Figure 10: Silent Hill's eerie fog

Both *Resident Evil* and *Silent Hill* heavily contributed to the diversification of horror gaming, offering players contrasting experiences within the genre. These iconic franchises have firmly established the foundations of survival horror and their influence continues to shape modern horror games.

2.3.3. 2000s

During the 2000s, the horror genre underwent a phase of significant experimentation with developers striving to craft unique and more terrifying experiences for players. However, as the decade progressed, many horror games began to **shift their focus more toward action** and less on pure horror, reflecting a changing trend in the gaming industry.

Fatal Frame

Fatal Frame (Shibata & Kikuchi, 2001) introduced a novel mechanic for horror gaming. Unlike most survival horror games that armed players with guns or melee weapons, *Fatal Frame* **equipped players with an analog camera.** When activated, this camera would shift the gameplay perspective to a stationary **first-person view**, forcing players to confront

spirits head-on. The closer a spirit got to the camera, the more damage it could inflict. This unique approach to combat, which required players to get up close and personal with the enemies, significantly heightened anxiety and fear during gameplay.

Figure 11: Example of Fatal Frame's fight with ghosts

Eternal Darkness

Eternal Darkness(Dyack, 2002) took a daring leap into psychological horror by introducing a **sanity meter.** As a player's character experienced terrifying events, their **sanity meter depleted**. When the meter was low, the game would **break the fourth wall**, playing mind-bending tricks on the player. These sanity effects ranged from hallucinations, such as fake error messages and false deletion of save files, to more surreal occurrences like changing the volume settings or simulating a system crash. These effects were so disorienting and clever that they left a lasting impression on players, and even though they were patented, the patent expired in 2021, opening up opportunities for similar innovations.

Dead Space

Dead Space (Schofield, 2008) revolutionized the survival horror genre by introducing **dismemberment** as a core gameplay mechanic. In this game, players faced grotesque, reanimated corpses and alien monstrosities. Traditional **headshots were ineffective**, and the only way to stop the nightmarish threats was to strategically dismember their limbs. This innovative approach to combat heightened tension and fear, as players needed to make quick, precise decisions under duress. *Dead Space* also adopted a **no-pause feature**, adding to the intensity of the experience.

Figure 12: Dismembering was crucial to stop the advance of enemies

Left 4 Dead 1 and 2

While *Left 4 Dead* (Booth, 2009) leaned more towards action, it incorporated **cooperative gameplay** into the horror genre. Players worked together as a team to fend off hordes of infected creatures. What set the game apart was the **AI Director**, which adjusted the gameplay dynamically based on the players' performance and gave **sound cues** to let the player know what events would happen next or what enemies were in the vicinity. **Changes made by the AI Director** on the enemies spawned, physical walls, resources spawned… Introduced a sense of unpredictability and made every playthrough unique.

Additionally, *Left 4 Dead* fostered a robust **modding community**, allowing players to create custom content and share their own horror experiences.

These games demonstrated that the horror genre was evolving in remarkable ways, offering new mechanics and experiences that leaned more toward an action-oriented approach, specifically within the first-person shooter subgenre. This shift emphasized jumpscares and gore imagery, diverting from the traditional horror experience. Over time, this evolution led to a **decline in the popularity** of pure horror-focused triple-A games.

2.3.4. 2010s

The 2010s marked a significant shift in the horror gaming landscape, with the emergence of many **indie game** developers who brought fresh ideas. These developers introduced unique mechanics and simplified previously existing ones, revitalizing the horror genre and giving it a resurgence in the medium.

Amnesia: The Dark Descent

Amnesia: The Dark Descent (Grip & Nilsson, 2010) is often hailed as a seminal title in the horror genre. One of its most significant mechanical innovations was its decision to **render the player utterly defenseless.** Instead of allowing players to fight back against the horrors that lurked in the dark, the game forced them to rely on their wits. Players could only **run and hide** from the monstrosities that stalked them. This mechanic induced a constant sense of vulnerability and dread, which was incremented with a **sanity meter** that was lowered upon remaining too much time in the dark, looking directly at enemies, or witnessing shocking imagery. Not only that, but as the sanity meter decreased, the **environment appeared more disturbing**, surreal, and dangerous. The loss of sanity was detrimental, but inevitable, as some unavoidable scripted sequences caused sanity to drop.

Figure 13: Visual parts of the scenario would change on the sanity dropping

Creepypasta Games

The popularity of internet horror stories, known as "Creepypasta," inspired a subgenre of indie horror games. Many of these games shared a common mechanical approach – the player was **unable to look directly** at the monster pursuing them. These games created a unique form of tension, as players had to navigate while avoiding direct eye contact with their pursuer.

Slender Man

Slender: The Eight Pages, a game based on the urban legend of Slender Man, initiated the trend of **micro-horror**. Players found themselves in a dark forest, armed only with a

flashlight, and were tasked with **collecting eight pages** while being pursued by the enigmatic Slender Man. Players could only walk and run, but **running impaired their vision** over time. Their primary actions involved collecting the pages and avoiding Slender Man, who would **deplete their life points if looked at directly**. Notably, Slender Man **only moved when the player was not looking at him**. This game's minimalist design and eerie atmosphere demonstrated how simple mechanics could evoke intense fear.

Figure 14: When looking upon the monster, the game would show audiovisual glitches

Source

Outlast

Outlast (Petty, 2013) shared similarities with Amnesia, but it introduced a twist to the sight mechanic. Players in Outlast were equipped with a night-vision camera, and since most of the scenarios were extremely dark, the camera's **night-vision feature was essential for visibility**. However, the game added a resource management element by **limiting the camera's battery life**. This limitation meant that players had to ration their use of night vision throughout the game, which intensified the suspense and fear of running out of this crucial resource.

Five Nights at Freddy's

Five Nights at Freddy's marked a significant shift in horror gameplay by diverting attention from direct confrontation to **a focus on preventing jump scares** (Which was the

Game Over). In the game, players assumed the role of a night security guard responsible for safeguarding a haunted pizzeria. While stationary, they had to skillfully **manage** various in-game mechanics, with a particular emphasis on the efficient use of the **power resource**, which depleted as players monitored security cameras or closed the doors in their vicinity. These actions were essential for avoiding potentially fatal encounters with animatronic characters. The game's remarkable success served as a testament to how **strategic gameplay elements** could effectively generate tension and fear.

Figure 15: Example of a jumpscare

These indie games demonstrated that horror could thrive on **simplicity and psychological terror**, resonating with a new generation of horror game enthusiasts.

The Last of Us

The Last of Us (Straley & Druckmann, 2013) drew inspiration from the natural world, basing its zombie-like infected creatures on a real fungus that parasitically attacks insects. This unique premise added a level of plausibility to the game's horrors. In terms of gameplay, the focus **leaned heavily towards stealth**, introducing the challenge of blind zombies with heightened senses. These creatures, narratively speaking, navigated the game's world using a form of echolocation, meaning that as long as players remained silent and avoided making noises, they could evade detection. Notably, the game featured different stages of infection, showcasing partially turned humans who retained some emotional reactions, effectively evoking feelings of disgust and sympathy within players.

PT Silent Hills

PT, a demo for the canceled *Silent Hills* project (Kojima & Del Toro, 2014), took the horror genre by storm with its effective approach. The demo kept players confined to a **single hallway**, shifting the focus to exploration and uncovering the story. It introduced Lisa, a single, terrifying enemy who constantly haunted the player. PT showcased the potential of a **tightly controlled environment** and a single, relentless adversary to generate fear and tension. It served as a prime example on how **level design** can and will affect the fear induced in the player.

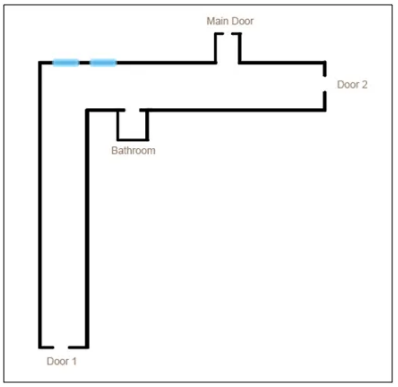


Figure 16: Layout of the demo

Source

The game featured **two rooms that were completely inaccessible**: the second floor and the room where the game begins. This deliberate design choice raised intriguing questions for players. Why were these rooms included? What hidden meanings or narratives could they hold? The unavailability of these spaces added to the mystery and sense of dread, further showcasing the psychological impact of thoughtful level design in a horror game. When players crossed the final door they found themselves inexplicably transported back to the first one. This unsettling mechanic had a profound effect on players, evoking a sense that something was profoundly amiss with the very structure of the environment. As they continued to move in what seemed like endless circles, the disorienting effect amplified the **feeling of confusion** and psychological disturbance. (Eisenmann, 2014)

The **tight corridors** with walls close together in *PT*'s level design were deliberate choices that masterfully evoked feelings of **claustrophobia** and urgency in the player. These elements created a sense of being trapped and pressured to find a way out of the house, amplifying the psychological tension. On the other hand, the long corridors in the game

appealed to **bathophobia**, a fear of deeply dimensioned volumes, such as long, dark hallways. This design choice heightened the player's sense of loneliness and vulnerability as they navigated these eerie spaces, adding to the overall atmosphere of fear and apprehension. (Eisenmann, 2014)

Another intriguing and architectural aspect of *PT*'s level design is that it consistently places the **player in a position where they have to turn their back** to various areas within the house, such as hallways, doors, or windows. This design choice taps into a common fear in horror games and films: that characters or players should never expose their backs to **potential threats** like monsters or killers. By forcing the player to repeatedly face away from these ominous spaces, PT manipulates this deep-seated fear, intensifying the player's sense of vulnerability and dread. (Eisenmann, 2014)

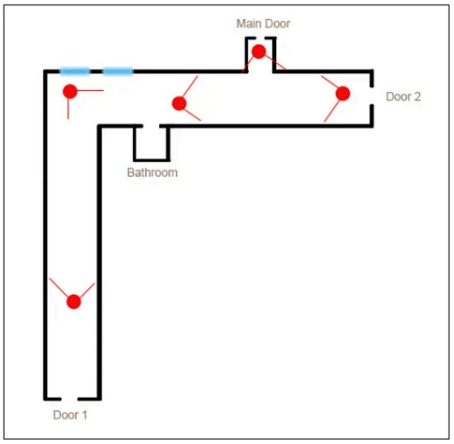


Figure 17: Example of the player's positioning

Source

Its deliberate and **unpredictable gameplay patterns** add to the disorienting and unsettling experience it offers. The initial stages of the game feature a fairly well-illuminated house, providing a false sense of security. As the player progresses through the cycles, subtle changes occur, such as the mysterious radio transmissions and the eventual loss of light. Entering the bathroom door later in the game, the player acquires a **flashlight**, further altering the dynamic of the experience. As the cycles continue, the house's lighting shifts to an eerie red hue, intensifying the oppressive atmosphere. These changes cause strangeness and confusion to the player, who will always be in a state of not knowing what's going to happen next. (Eisenmann, 2014)

PT's intentional limitation of player controls adds another layer of anxiety to the experience. Players are provided with minimal control, primarily allowing **movement** and a **zoom** function. Said ability to look closer at disturbing scenes challenges players to confront the horrifying imagery even when their instincts urge them to turn away. This mechanic forces players to go against their natural inclination to avoid disturbing sights, amplifying the psychological horror and sense of dread. (Eisenmann, 2014)

PT indeed shares a world-building approach similar to Stanley Kubrick's *The Shining* (1980), both leaving unexplained elements within their narratives. This **deliberate ambiguity** is designed to pique the interest of the audience or players, inviting them to create various theories and interpretations about the experiences.

In *The Shining*, the **impossible architecture** of the Overlook Hotel raises questions about its layout and connections between spaces, adding to the eerie and unsettling atmosphere. Similarly, in *PT*, the constantly shifting environment and unexplained phenomena within the house create a sense of disorientation and confusion, leaving players to wonder about the nature of the horrors they are experiencing.

By **not providing clear answers** and leaving room for **interpretation,** both The Shining and PT **heighten the intrigue** and engagement of their audiences, making them contemplate the deeper mysteries hidden within the narrative (Ager, 2008). This shared storytelling technique is a testament to their effectiveness in building tension, fear, and fascination within the horror genre.

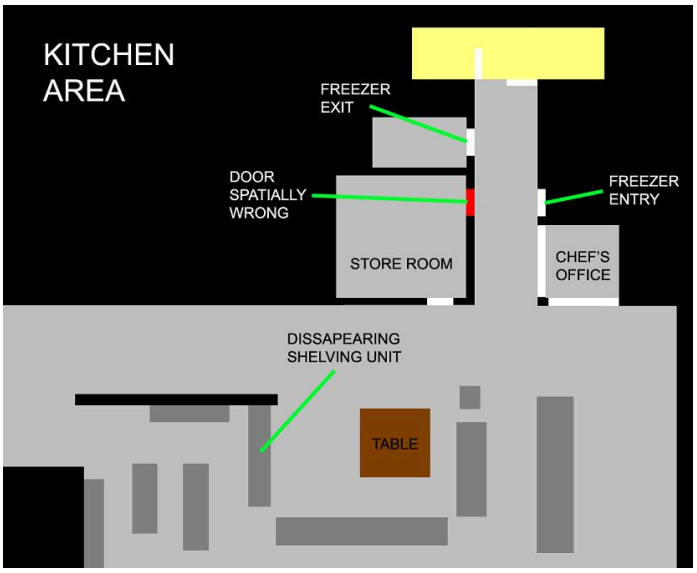


Figure 18: Example of impossible architecture in The Shining

Source

Alien: Isolation

The game (Hope, 2014) introduced a **tracker device** to allow players to see the approximate location of the alien antagonist. Players were not equipped to combat the alien, emphasizing the importance of stealth and evasion. **One-shot death** mechanics heightened the stakes, adding tension to every encounter. The alien AI was not fully scripted and benefited from another AI, **the "director AI"** that coordinated the alien's behavior depending on the player's current state and position through the map, creating the illusion of a learning and adaptive enemy.

Until Dawn

Until Dawn (Byles & Bowen, 2015) utilized biometric sensors (QPGames, 2015) to measure the emotional response of playtesters such as increase of sweat and heart rate, providing valuable data in the form of graphs on how the game induced fear and tension in players.

The game's design focused on creating **a narrative driven by player choices** and actions, heavily influenced by the **butterfly effect**. This mechanic meant that even small decisions could have significant repercussions on the storyline and character relationships.

The game's **quick-time events** played a pivotal role in shaping the narrative. Players were often required to make **split-second choices** or perform actions under intense pressure, and these decisions could lead to various outcomes. The butterfly effect concept emphasized that even minor choices could cascade into major story changes, giving players a sense of agency and consequence.

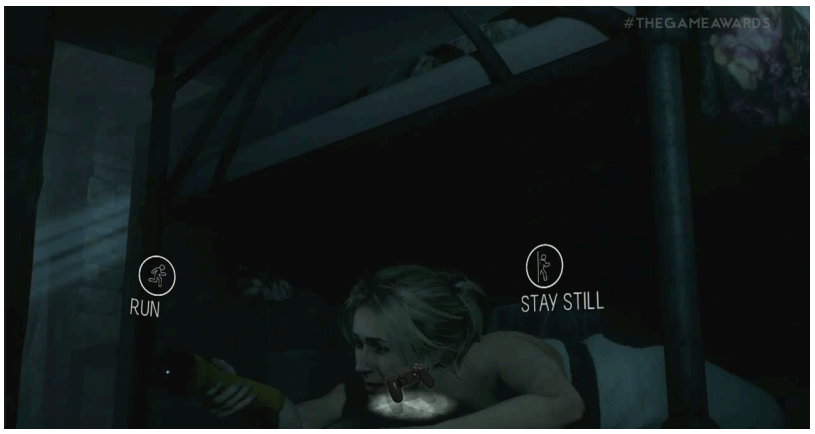


Figure 19: Decisions that could influence the direction of the game

The permanence of decisions and their weight were amplified with its autosave system, which eliminated the possibility of players returning to earlier save points. This design choice heightened the stakes and added a layer of permanence to players' decisions; they had to live with the consequences of their choices, featuring a staggering **186 unique endings**.

Dead by Daylight:

Dead by Daylight (Panell et al., 2017) was the first **asymmetric multiplayer horror game**. Said asymmetry was referenced in the roles, and therefore mechanics of each group of players: **survivors** and **a killer**. The cooperative experience in *Dead by Daylight* revolves around the survivors, who must work together to escape the deadly clutches of the killer. Each survivor must outwit, outmaneuver, and collaborate with their teammates to repair generators and open the exit gates while avoiding the relentless pursuit of the killer.

The killer characters in *Dead by Daylight* are drawn from various horror franchises, each one with speed, attack and "Terror radius" (Where the **killers can hear the heartbeat** of survivors) differences, adding a unique twist to the gameplay. For instance, characters like Michael Myers from *Halloween*, and many more are available to play as killers.

The survivors are played from a **third-person** perspective, while the killer's point of view is in the **first person**. This asymmetry adds an extra layer of tension and strategy to the game, as the survivors must rely on communication and teamwork to outsmart the killer. Meanwhile, the killer aims to hunt down and eliminate the survivors one by one.

Figure 20: POV of the killer

The 2010s finished as a fascinating period for horror gaming, marked by the **resurgence of the pure horror elements** in the *Resident Evil* series. Games like *Resident Evil 7* introduced players to a completely new story and shifted the series back to its terrifying roots, drawing inspiration from the PT demo. Meanwhile, the remakes of *Resident Evil 2* and *Resident Evil 3* in the 20s **revitalized classic formulas**, delivering polished and immersive experiences that both honor the originals and offer fresh perspectives on the iconic games.

Figure 21: Comparison between RE2 and RE2 Remake

Source

2.3.5. 2020s

The 2020s are currently being a **transformative** decade for the horror genre in the world of video games. The genre has witnessed a recent resurgence of pure horror titles, marking a **return to the genre's roots**, and a continuous creative explosion in the indie development scene.

Phasmophobia

Phasmophobia (Knight, 2020) is a **cooperative horror** game that places players in the shoes of ghost hunters tasked with uncovering the mysteries of various haunted locations. The game's primary objective is **to identify the type of spirit** that haunts a specific area, which requires players to work together closely. Communication is essential in "Phasmophobia," and the game achieves this through its **proximity chat** and **walkie-talkie system.** This unique approach adds a layer of realism to the cooperative experience, as players must communicate effectively to share findings, coordinate actions, and support each other in the face of terrifying encounters.

Players will often **split up to explore** different areas of a location, adding an element of vulnerability as they venture into the unknown. The game's **sanity points diminish** over time as players spend more time in a haunted location or encounter paranormal phenomena. This not only simulates the psychological toll of ghost hunting but also serves as a gameplay element. The lower a player's sanity, the more **susceptible they become to ghostly manifestations** and hostile activity, amplifying the tension and fear.

When a ghost decides to **haunt** the players, the environment becomes even more ominous as doors lock, lights flicker, and electronic **devices become unreliable**. The sudden shift from relative safety to a hostile paranormal encounter creates intense moments where players must scramble to protect themselves while attempting to gather evidence to identify the spirit.

GTFO

GTFO (Andersson, 2021) is a first person, **extraction survival horror shooter** developed where the primary objective is to **extract valuable artifact**s while exploring this hazardous environment, complete various objectives, and deciding to fight or avoid waves of monstrous entities.

The game features previously explored mechanics such as cooperative multiplayer, resource scarcity and management emphasizing on the **necessity to strategy** and constant plan due to the threat of the enemies, who remain dormant and can be awakened by sounds of moving, shooting and even opening doors or crates.

But where it really shines is with the use of **randomized maps**, the use of small clues to let the player decide which way to explore to **find the extractable object** and the very challenging attack **patterns of enemies**, one of which notably, while being blind uses appendixes that will extend far away and when on contact with the player, will alert itself and other enemies, adding another layer of anxiety to induce to the player.

Figure 22: A scout searching for players with its tentacles

As a closing statement, the horror genre has solidified its place in the gaming world as one of the most played and beloved genres. Over the years, it has evolved significantly, introducing innovative mechanics and dynamics that continue to terrify and captivate players. As we move further into the future, the genre shows no signs of slowing down. Game developers are exploring new horizons, such as open-world horror and various forms of cooperative horror experiences, promising even more immersive adventures for players to enjoy. The rich history and evolution of the horror genre demonstrate its enduring appeal and its permanence in the industry of video games.

2.4. Current theories and frameworks

With a foundational understanding of the status of the main concepts, we are now prepared to delve into some of the existing documentation related to mechanics and dynamics that have been found for this study.

Konstantinos Ntoko's ***Level of Fear Spectrum*** classification is a valuable resource, even though it may be considered relatively general and, like most of the existing material, **specific for the aesthetic part**. Still, this classification contains **valuable mechanical cues** that can be harnessed as a reference list as well as examples that offer significant guidance to level designers seeking to **build tension effectively** or to gauge the player's emotional state as they progress through the game. (2018, p.34-40).

Level	Feeling	Game Situation	Examples
1	Calmness	Complete absence of fear; Player can freely explore around.	Safe-House, Sanctuary, Save Point, heavily guarded area
2	Mild Anxiety (Nervousness)	Partial existence of the unknown that has caused possibly deaths, player is intrigued but doesn't know much information	Traces of unexplained or supernatural phenomena around environment through story elements
3	Moderate Anxiety (Vigilance)	Fear starts being added in; Player must be aware of the environment	Visual cues of blood and gore, evidence of unknown murdering forces
4	Severe Anxiety (Restlessness)	Fear is adaptively giving trouble to the player who must pay attention to the environment around him.	Audio cues building up tension, minor objects start operating on their own with minor changes
5	Mild Stress (Fright)	Player fears what he cannot see or hear or explain; Minor or major changes in the environment around the player is more likely to scare him now	Hearing voices or footsteps, but not seeing anything, inanimate objects moving, falling or breaking
6	Severe stress (Distress)	Fear is starting to take away reasoning and logic from the player; survival instincts start emerging	Witness an act of violence through visuals and /or audio

7	Mild Fear (Fright)	Survival instincts and quick reflexes are taking the place of reasoning and logic; The player is more likely to get scared via minor environmental changes	Audio-visual cues as to the whereabouts of an enemy who is far, common weak jumpscares, hiding
8	Severe Fear (Dread)	Player is focused on not being detected by the monster; Danger would be lurking at any corner now	Audio-visual cues as to the whereabouts of an enemy who is close by, loud noise jumpscares
9	Terror	Player will either survive or not; Quick actions have almost taken the place of control and reasoning	Enemy chasing player, running out of ammo or reloading during combat
10	Panic	Complete absence of control; fight or-flight situation; pausing/exiting the game, leaving controllers or taking off headset	Enemy surprise attack, Strong Jumpscare, Enemy has almost caught the player

Figure 23: The Level of Fear Spectrum

Still, as other models, most of the focus comes on the visual and sound design, such as “Hearing voices”, “Visual cues of blood and gore”, which after further analysis, we might find it’s **not entirely directly correlated with terror** itself.

For instance, in the game "*Fear and Hunger 2: Termina*" (Haverinen, 2022) the revelation that a **character can lose limbs permanently** in and out of a fight, resulting in a **mechanical modification**, such as reduction in attack power, rendering them incapable of using heavy weapons or even losing the ability to run or go up stairs. This instills a sense of dread in the player. Similarly, the awareness that **saving progress is a permanent action**, causing the **passage of half a day** with the looming threat of an unspecified c**atastrophe in the next four days**, can evoke fear in the player. These examples add more to the discussion on how in-game mechanics can be pivotal in generating emotional responses in the player.

Figure 24: A character that has lost their legs due to a trap

Casper S. Boonen and Daniel Mieritz in their paper on the *Agency Parameter Mode*l, identify several **crucial elements** that influence the player's **sense of agency** and, subsequently, how these elements can be harnessed **to evoke horror**. The examination of limitations imposed on character actions, the strategic placement of enemies, constraints related to player skills, and even the influence of the game system itself (as exemplified by the iconic fog in Silent Hill 1(Toyama, 1999) created due to the rendering limitations of the PlayStation 1) is paramount. This comprehensive analysis serves as a **valuable tool for game designers**, offering insights into how to manipulate these elements to make crucial decisions on their core design. (Boonen & Mieritz, 2018, 5) Said parameters are:

- **Player Character Parameters** (p.5) being very specific towards the actual player character and their abilities through its resolution of conflict. And as Boonen and Mieritz state: “ The player is supposed to feel challenged, and that they are surviving only by a hair's breadth, adding pressure and fright when encountering enemies, and terror of the prospect of coming across them. “

    - **Physical Parameters** (p.6-7) that limit or enable the player actions, such as enemies constraining freedom of movement, enemies that immobilize the player or even size difference in the actual level.

    - **Psychological Parameters** (p.7) that limit or enable the players actions through the player character psychological capacity with dynamic elements such as sanity points that upon lowering, impact on the player current status.

- **System Parameters** (p.5) relating to the constraints and affordances that are created from the game's system and its world.

    - **Material Parameters** (p.7-8) such as the total number of enemies at the same time or or the amount of resources (And availability of them) that can either empower or disempower the player.

    - **Technical Parameters** (p.6) that limit player actions are simply not supported by the game's design or computational model. Such as being able to jump or not or being able to see further or not due to the rendering engine.

- **Player Parameters** (p.5) which are the abilities from the player itself to execute the actions, such as their own reflexes to nail a quicktime event.

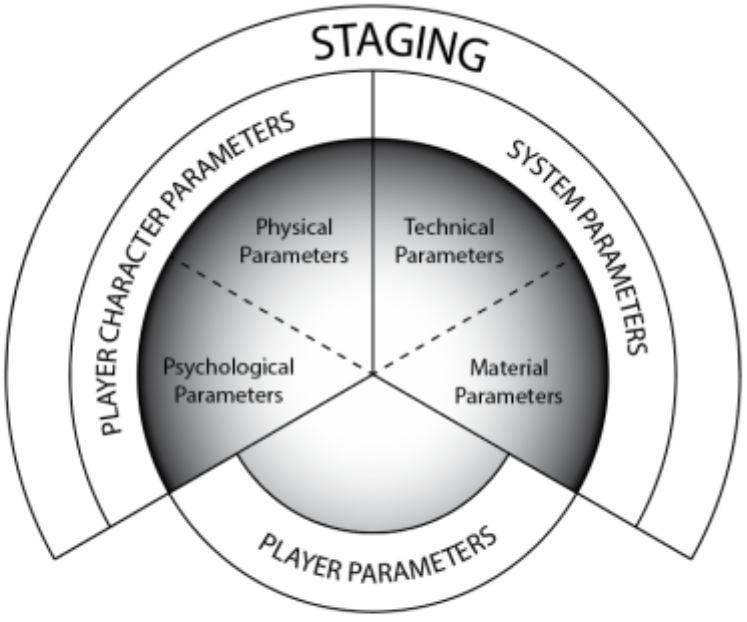


Figure 25: Diagram of the Agency Parameter Model

In Joshua Bycer's book, *Game Design: Deep Dive Horror* (2021), presents compelling insights into **essential mechanics and dynamics** of the horror genre:

- **Event Triggers:** Bycer emphasizes the importance of event triggers in horror games. These triggers, when strategically and thoughtfully positioned within the level, play a pivotal role in shaping tension management. However, the nuance lies in the fact that jump scares, while impactful, can lose their effectiveness when used in isolation over time. To maintain their power, specific techniques in level design must be meticulously employed. Elements such as timing and buildup are paramount in creating a truly frightening experience for the player. (p.29)

Therefore, it can be argued that the correlation between event **triggers and level design is integral** to the art of crafting effective horror in games. The conjunction of well-placed event triggers and thoughtful level design techniques maximizes the impact of these mechanics, immersing players in an environment where fear and suspense are organically cultivated.

- **Resource Management:** Bycer's view on resource management in survival horror aligns with the notion of **keeping players in a perpetual state of unease** regarding their resources. If the concept is furthermore expanded beyond the conventional focus on ammo and health points, new interesting interactions could be discovered. (p.45)

Incorporating **save states as a resource** for the player, akin to how it's done in *Resident Evil 2* (Mikami, 1999), can add a layer of complexity to the gameplay. This approach necessitates thoughtful management of save points, with players having to make strategic decisions about when and where to save their progress. It introduces an element of risk, as making poor choices in save management can lead to **significant setbacks or challenges**.

Alternatively, using **save states as a means of advancing** (or not) the narrative, as seen in games like *Fear and Hunger 2: Termina* (Haverinen, 2022), provides an intriguing **twist**. In this scenario, players must be judicious in their use of save states to not only safeguard progress but also drive the narrative forward. This mechanic interweaves player agency and story progression, creating a unique dynamic that can significantly impact the horror experience.

- **Combat:** Insight into the impact of combat mechanics on the horror experience is both astute and valuable. Indeed, examples such as Resident Evil 5 (Anpo, 2009) serve as a pertinent case study, where an **overemphasis on empowering** the player led to the **diminishment of the horror** atmosphere throughout a significant portion of the game. The careful balance of player power is essential to maintaining a sense of vulnerability and fear in horror games. (p.45)

Bycer's emphasis on the **necessity for variation in threats** and situations to prevent player desensitization is a crucial point. Horror games must continuously introduce new challenges, adversaries, and scenarios in the form of the “unknown” to keep the player on a constant **cycle of needing to adapt.** This approach helps sustain the horror ambiance and prevent it from waning over time. (p. 45)

The concept of an **enemy tier list** is indeed valuable in the context of certain horror game designs, but its applicability may vary depending on the specific nature and objectives of the game. Not all horror games necessitate a traditional hierarchical list of enemies, and each game's unique mechanics and dynamics may dictate alternative approaches to maintaining tension and fear.

Tier	Enemies	Mechanics
1	Zombies	Slow-moving enemies that attack in close range with acid vomit or grabbing and biting. Shotgun headshot kills.
2	Hunters, spiders	Hunters are fast-moving enemies with jump attacks and claw swipes. Spiders throw poison.
3	Crows, Cerberus dogs, bees, plant tendrils, sharks	Crows are fast and hard to hit. Cerberus attacks in packs. Bees do minor damage and poison. Plant tendrils are invulnerable. Sharks require water drainage.
4	Yawn, Plant 42, Black Tiger, Tyrant	Yawn causes massive damage. Plant 42 weakened by a puzzle. Black Tiger is a larger, faster spider. Tyrant attacks with grabs and swipes. Requires rocket launcher to finish.

Figure 26: Enemy tier list of Resident Evil

The existence of the **Alpha Antagonist** figure, an immortal enemy that actively **hunts the player** and has the potential to modify the tension of the level, is a significant and often universal element in many horror games. This formidable figure, whether constantly present or looming in the background, **has the power to generate profound anxiety** and fear in players. (Bycer, 2019)

The mere **anticipation** of the Alpha Antagonist's existence can create a sense of **impending dread**. Players know that their every move is being monitored, and the constant threat of an encounter amplifies the tension and suspense throughout the game. The psychological impact of an ever-present, virtually invincible enemy is a potent tool for horror game design.

- **Weapons:** While the discussion of weapon tiers in his book (Bycer, 2021, p. 45) is valuable, yet it's important to recognize that **this concept may not be universally applicabl**e to all horror games, especially those with different combat systems such as melee-based or RPG-based mechanics. Bycer's classification, which closely mirrors the weapon progression seen in *Resident Evil* games, may not fully encompass the diverse array of horror game designs.

Tier	Weapon	Mechanics
1	Combat Knife	Weak but no ammo used
2	Handgun	Basic long range and does minimal damage. Uses the most common ammo.
3	Shotgun	Close range and does moderate damage. Uncommon ammo.
4	Grenade Launcher	Short to mid range, varying damage. Rare ammo.
5	Magnum	Any range, heavy damage, rarest ammo.
6	Rocket Launcher	Any range, heaviest damage, only one round.

Figure 27:Weapon tier list

Indeed, the theme of weapons and their role in horror game design warrants further exploration and examination. This exploration should encompass a broader spectrum of games with **varying combat systems**, acknowledging the unique mechanics and dynamics that define their weapon progression. On the other hand, a very interesting point is made in his blog: “What separates horror from other genres when it comes to fighting is that the player should understand that maybe **they shouldn’t be fighting every enemy.**” (Bycer, 2018) This interesting mindset, where players are encouraged to make strategic decisions about when to **engage** in combat and when to **avoid** it, serves as a foundational element in shaping the mechanics and dynamics related to both combat and enemy design. It underlines the importance of crafting mechanics that enhance the player's ability to make **informed choices** and the necessity of creating enemies that present distinct challenges and consequences.

- **Stealth:** Bycer's general points about stealth (p.55) are very valuable, posing several questions as variables for the stealth dynamic of the game and can serve as an invaluable starting point for the design process.

1	What detection systems will the enemy use?
2	What range will the enemy detect the player?
3	How does the enemy search for the player?
4	How quickly does the enemy respond to the player?
5	What happens when the player is detected?
6	Can the enemy be killed?

Figure 28: Bycer’s stealth questions

- **Puzzles:** As the book correctly states they serve as a means to engage players' intellect but to add layers of **complexity** to the gaming experience, to contribute to the **tension reduction** and to add a general **change of beat** through the level.

Given these initial concepts and insights, we are provided with a promising foundation for further possible theories. However, further refinement and expansion of the analysis is necessary to provide comprehensive and valuable information.

2.5. Conclusion

Before starting it is important to define the **difference** between fear, horror, disgust and anxiety from the point of view of a video game using Carrol's concepts(2018) mixed with the two-factor emotion definition (Schachter & Singer, 1962, 3)

- **Horror:** Set of mechanics, dynamics or/and aesthetics that evoke fear, anxiety and/or disgust emotions.

- **Fear:** physiological arousal using the actual existent threat (Monster or any kind of danger) as a label.

- **Anxiety:** physiological arousal using non-existent or non-present threat (A monster that might be there but it's not, sound cues that alert the player…etc.) as a label.

- **Disgust:** physiological arousal using a repulsive element (Either gore but also impactful narrative circumstances) as a label.

With this clear, over the four decades of its existence, and owing to the influential titles mentioned previously, a **set of fundamental mechanics and dynamics** that have continued to shape the horror genre over the years can be identified. Note that not all of these need to be in a horror game in order for it to be a good horror game.

Strategic implementation of **limited inventory space**. This, coupled with the **scarcity** of various resources such as batteries, energy, health, saving tools, and ammunition, intensifies the player's experience. The **fear of depletion** heightens during each conflict or pivotal decision, forcing players to carefully manage their resources. This dynamic creates a palpable sense of vulnerability, contributing to the overall horror.

An additional layer of tension is introduced through **reactive resource spawn**. This dynamic system responds to the player's needs, occasionally providing assistance during critical moments. However, the randomness and occasional inconvenience of the spawned resources add an unpredictable element. This **intentional ambiguity** contributes to the

overall sense of unease, as players can't fully anticipate the nature of the aid they may receive, fostering a more unpredictable and replayable gameplay experience.

A **soft-lock-solver**, like a knife for example, in order to offer the players a tool to avoid soft locking themselves in challenging situations, but still giving consequences to the use of it (For example, being easier to get hurt by enemies while being used)striking a balance between resolution and maintaining tension.)

Different **choices on how to solve conflict**, either by fighting (With action mechanics or RPG mechanics) enemies, avoiding, hiding or escaping from them. The player should be able to at least try not to face conflict on some occasions.

Delayed and limited actions such as movement, interactions and/or attack. This can be done by making the player slow or completely static when attacking, with tank movement controls or even with small interactions that need the button to be pressed for one second.

Causative of conflict, this can be in the form of normal enemies that can be fought or avoided or/and an **alpha antagonist** (Usually the monster) that will pursue the player in parts of the level. The latter's behavior will need to be carefully designed in order to empower it enough with mechanics such as immortality or damage on pure sight, but moreover with an **active chasing of the player**. The alpha antagonist needs to be heavily planned on how and when will be active in the level in order to amplify the tension properly and not provide an excess of unnecessary and therefore frustrating, difficulty.

Information obscuring, where health, ammo, sanity… Any stat-related points regarding either the player or enemies are either not directly expressed or expressed in a convoluted way, in order for the player to give an extra layer of artificial difficulty when making decisions. Also story-related information, the game needs to give slight pieces of information as if it was a path of candy leading to somewhere.

Slight randomization of some kind such as the position of the resources of each run or even physical walls of the level in order to not let the player adapt to previously established patterns. If planned carefully, this can be done in-level instead of per run.

Limited visibility by either having fixed cameras or dynamic cameras that move in specific ways in order to deliver information slower, with fog or darkness, the field of view of the player or even level design itself, with sharp 90º turns for example.

Evident safe spaces in order to be able to lower the tension and **reset the emotion status of the player**. Changing the beat of the gameplay to a more narrative or even puzzle way without having to face the conflict for a few minutes can restart the emotional status of the player in order to be able to raise fear again.

Not allowing the player to use the inventory as a safe space or even being a safe space and modifying the pattern in a certain given moment.

Timed decision based events, where the player has to make an important choice that will move the narrative forward (Or not, some the decisions can always be fake)

Permanence of consequences, by either modifying the gameplay pattern due to a loss of a limb of a player or due a narrative choice.

Exploration rewards, such as resources but moreover pieces of narrative that can help the player survive or/and move forward the history of the game.

Vague sound cues about situations that will happen soon (An enemy being close for example). While these can facilitate the strategy it also creates anxiety by expectation, which in turn intensifies the perceived artificial difficulty of the game.

Thigh corridors but also **open spaces**, since both can be equally unsettling, specially as an abrupt change of level design in order to introduce new dangers.

Unreliability of game patterns in order to not let the player adapt, therefore lose uncertainty and lessen the fear. From slight changes like adding the presence of an alpha antagonist to a level where previously wasn't there, modifying safe spaces to make them not safe to even change the gameplay completely.

Several examples: What if the character, which was able to move normally now has to move in a wheelchair and cannot shoot and move at the same time? What if we're not sure if an enemy is currently dead? What if their movement is erratic and therefore hard to shoot? What if specific tools cannot be used during an event? What if the weapon suddenly becomes jammed? What if it breaks? What if the game was previously in an open space and now it's in a tight corridor? All of these abrupt changes have the potential to amplify the anxiety on the player.

Planned jumpscares, only to be used when the tension is at the maximum as a release followed by a safe space or moment. Random jumpscares or the overuse of them will endanger the level of horror given to players since they can become used to them.

Director AI that will monitor the player's advance and current status then take decisions to affect or control previously mechanics mentioned before, such as the Alpha Antagonist, the reactive resource spawn, the slight randomization and even planned jumpscares.

Additionally, depending on the game's genre, it can be benefited with **permadeath** and / or **proximity chat**.

The horror genre will continue to evolve, exploring new frontiers. The nature of the open-world and even sand-boxes might allow new more unpredictable patterns to appear. Cooperative genres, in conjunction with puzzle-solving and escape rooms, have the potential to introduce collaborative elements together with previously explored horror mechanics and dynamics that might enhance the social aspect of horror gaming.

Indeed, the genre's adaptability and commitment to providing diverse and engaging experiences for players will ensure that the exploration of horror remains at the forefront of the video games future.

3. Project Management

3.1. Project Definition

The project comprises two distinct components: a theoretical segment (**Thesis**) and a video game prototype (Referred as **technical demo**).

The prototype development will encompass all aspects of video game pre-production, with the ultimate goal of creating a vertical slice that can be presented to potential publishers and investors by the third quarter of 2024.

The video game, titled **Chirality: The First Journal** (Abbreviated as Chirality), will be developed by the Slumber Party Games team, consisting of five members, with the author of this document serving as the co-founder, producer, and director of the studio.

3.2. General Objectives

The primary objective of this project is to identify, structure, and formulate the **essential mechanics and dynamics that amplify the horror aesthetic** in a horror game and prove said theories in the technical demo. The secondary aim is to **create the basis for a commercial technical demo** for computer platforms, specifically targeting distribution on the Steam platform. This project seeks to amalgamate theoretical insights with practical application, resulting in a compelling and commercially viable horror game.

Specifically, for the thesis the main objectives are:

1. To create documentation that will serve as a blueprint for future game designers.
2. To showcase, organize and explain the different techniques, using mechanics and dynamics that will create, support or improve the fear aesthetics in a video game.

And for the technical demo:

1. 15-minute prototype of Chirality that will be further developed into a vertical slice.
2. 15-minute gameplay video of Chirality without commentary.
3. A 5-minute pitch, covering the basics of the demo.

Furthermore, the technical demo will serve as a **vital component of the Slumber Party Games studio's portfolio,** bolstering its credentials and showcasing the team's capabilities. Additionally, it will act as a foundational resource for the creation of essential materials required for the publishing pitch, enhancing the studio's prospects for securing funding and partnerships in the future.

3.3. Methodology

Due to the dual nature of this project, which encompasses both the thesis and the technical demo, an **iterative methodology** will be employed. The development of the technical demo will occur in **tandem** with the theoretical research, with each component influencing and refining the other. This iterative approach is intended to facilitate the testing and validation of the identified theories in practical application.

To manage the development team and maintain project transparency, an **Agile methodology** will be adopted, supported by a **Kanban board**. Given the initial state of uncertainty and the ever-evolving nature of the project, goals will remain intentionally general and flexible. This approach encourages a "play" mentality, allowing for **experimentation,** adaptation, and testing of various theories. This strategy serves to allocate dedicated time for the development of the theories essential for the prototype. Subsequently, these theories will be beta-tested using a public demo, designed to gather as much feedback as possible in an automated manner. This comprehensive approach, integrating theory and practice, will contribute significantly to reaching a **well-informed conclusion for the study**, thereby enhancing the project's overall success.

3.3.1. Notations and Conventions

The thesis will use the following convention for its writing:

- Font: Times New Roman (Size 12).
- Line Spacing: 1.5.
- **Bold:** Guide the reader, summarize concepts.
- **Grey Bold: Figure and tables.**
- *Italics:* Key terms and titles of literature works.
- Citations: APA (7th ed.)

3.3.2. Specific methodology for each stage

To uphold the **credibility and accuracy** of the assimilated information, **rigorous research** will be conducted in the initial phases of the thesis, drawing from reputable books, well-regarded blogs, and scholarly journal articles. This comprehensive exploration done with web searchers such as *Google Scholar* aims to establish a thorough understanding of the current context and identify **a justifiable research problem**.

The author's research on horror games documentation that employs the MDA Framework, will be focused on obtaining **specific information** related to **mechanics** and **dynamics**. This approach aims to assess the **validity** of the presented problem. Once the research phase concludes, either upon the exhaustion of relevant information or after two months of dedicated research, the author will embark on a **systematic dissection** of each source. The goal is to **categorize the information** into themes, facilitating the identification of patterns or the recognition of their absence within the gathered data.

To augment the research, particularly in areas where the author lacks expertise, a series of **interviews with psychologists** will be conducted. The aim is to gain foundational insights into the specific emotion of fear, providing a valuable starting point for the exploration of psychological aspects related to horror games.

The gathered information will be presented in a paraphrased format, accompanied by examples and various perspectives to enable **effective comparison**. It is crucial to note that the author will diligently include proper references, utilizing **citations** and a comprehensive bibliography, to duly acknowledge and credit the original sources throughout the thesis. This approach ensures transparency and integrity in citing external contributions to the research.

Upon completion of the theoretical groundwork, the technical demo will be approved for further **development** to undergo **testing**. Following the gameplay experience, players will be directed to a **Google Forms survey**, designed for them to provide feedback. The collected data will then be **analyzed and presented** in the form of graphs, enabling the author to assess the **relevance and effectiveness** of the study. This **feedback loop** ensures a comprehensive evaluation of the implemented concepts and mechanics in the practical context of the game.

3.3.3. Technology

During the prototyping phase, **GDevelop** (Gdevelop, 2023) has been chosen as the **game engine** due to its user-friendly interface, making it an ideal choice for the development process. Artwork and assets will be crafted using **Photoshop** (Adobe Inc., 2022), while 2D animations will be produced with **Spine 2D** (Esoteric Software, 2022).

The composition of real-life footage, if necessary, will be processed using **Nuke X** (The Foundry, 2022). All aspects of video and trailer production will be edited with **DaVinci Resolve** (Black Magic Design, 2023) and sound design for the project will be composed using **Reaper** (Cockos, 2023).

Lastly, team management and communication will be handled through a combination of **Discord** (Discord, 2023) for real-time collaboration, **Trello** (Atlassian, 2023) for task tracking, and **Google sheet (**Alphabet Inc., 2023) for data organization and management. This combination of tools and software will enable a well-rounded and effective approach to both development of the technical demo and the thesis.

3.4. Planning

3.4.1. Scope of the game

Slumber Party Games will **create** the horror video game **prototype** of **Chirality: The First Journal**. This prototype will feature a **fifteen-minute-long gameplay** segment, specifically designed for the **purpose of testing, confirming, disproving**, or refining the theories outlined in the written document.

The polish and quality of this prototype will be determined by the definition of project deliverables, a comprehensive understanding of limitations, and the efficient allocation of available resources. By adhering to these parameters, the prototype will serve as a crucial tool for evaluating and fine-tuning the theories presented in the project.

3.4.2. Deliverables breakdown

Please note that this breakdown is general and tries to encompass all of the deliveries without going to extreme detail. A more detailed breakdown of the technical demo will be added in the annex in order to properly track the tasks needed in order to create the prototype.

Thesis Deliverables	Technical Demo Deliverables
Project Development plan	One Page Document
Research of the current literature	MDA Breakdown of the prototype
Theoretical Framework	GDD, LDD and 5 minute pitch
Beta-testing survey creation and analysis	Market Research
Conclusion of the study	Narrative Document
Thesis defense presentation	Video game Prototype

Figure 29: project deliverables

3.4.3. Milestones

The *Universitat Oberta de Catalunya* has established a set of milestones that are **obligatory deliveries** as part of the master 's program. These milestones serve as crucial points of assessment and progress throughout the academic journey, ensuring that the author meets the program's **requirements and standards.** These milestones are designed to track and evaluate the development and mastery of the program's core concepts and competencies.

		Name of Delivery	Dates
PEC	1	PEC01 - Project Plan	08/10/23
	2	PEC02 - Theoretical Framework	12/11/23
	3	PEC03 - First Playable Version	17/12/23
	4	PEC04 - Final Delivery	14/01/24
	5	PEC05 - Thesis Defense	24/01/24

Figure 30: Thesis milestones

On the other hand, the milestones established by the Slumber Party Team will adopt a more relaxed approach. Given the voluntary nature of the work, the focus will primarily revolve around the **delivery of the game prototype**. These milestones will serve as flexible **checkpoints** to monitor progress and ensure the timely completion of the prototype, while allowing for adaptability and accommodating the team's availability and commitment.

		Name of Delivery	Dates
DELIVERABLES	1	Prototype V1	17/12/23
	2	Prototype V2	01/01/24

Figure 31: Technical demo milestones

3.4.4. Limitations

To accurately evaluate the project, a **SWOT analysis** has been conducted to comprehensively assess the project from a holistic perspective. This analysis allows for a thorough examination of the project's strengths, weaknesses, opportunities, and threats, enabling the project team to develop a well-informed and strategic approach to the project's overall management and execution.

S	➔ Highly skilled team. ➔ Shared long term goals, both on the business aspect but in the work of art itself. ➔ All of the integrants want to transition from the Animation and VFX industry to the gaming industry.
W	➔ Remote work. ➔ All of the integrants have a primary job outside of the development, meaning that full time development is not currently possible. ➔ No budget. One semester time limit. ➔ Possibilities on bottlenecking at the start of the production, due to the dependency of the thesis advances ➔ Possibilities of bottleneck on the level design final phase due to Gdevelop files not being able to be worked in tandem.
O	➔ Strong USP, backed by a market study, amplifying the possibilities of a commercial success. ➔ Given the absence of documentation regarding the mechanics and dynamics guidelines for the genre, the completed document can prove to be highly valuable.
T	➔ Not being able to give enough quality to the prototype due to the time constraints. ➔ Most of the theories being disproven, lowering the value of the documentation.

Figure 32: SWOT

The project's risks will be systematically assessed and addressed through a well-structured approach. This strategy includes:

- **Weekly Meetings:** Regular weekly meetings will be held to discuss and assess potential risks and issues. These meetings will facilitate proactive risk identification and enable the team to collaboratively address emerging challenges.

- **Continuous Replanning:** The project will incorporate a dynamic replanning process, allowing for adjustments and adaptations as technical issues arise. This approach ensures that the project remains responsive to changing circumstances.

- **Scope Management:** To mitigate risks, the team will proactively manage the project's scope. This may involve scaling down the prototype to ensure it aligns with the available resources and constraints.

- **Theory Development:** The project will prioritize the establishment of mechanics and dynamics listing before the midpoint of the semester. This early definition of theories allows for ample development time and ensures that the project stays on track.

By implementing these risk management strategies, the project aims to identify, mitigate, and **address potential issues effectively**, ultimately enhancing its chances of successful completion.

3.4.5. Resources

Slumber Party Games Team	
Eduardo J. Reyes	Director, Game Developer, Project Manager
Davide Turotti	Art Director, Concept Artist, Compositor
Paula Soler	2D Animator, Level Designer
Demir Danışman	Game Developer
Aina Serra	Concept Artist

Figure 33: Slumber Party Games team

The author's role as a university teacher presents a valuable opportunity to engage **additional collaborators** who may contribute to the project's prototype. It is worth noting that all collaborators involved in the project will receive **proper credit** and recognition as the project progresses, acknowledging their valuable contributions to its development.

This collaborative approach leverages the author's academic connections to enrich the project and foster a spirit of shared achievement.

Technology resources	
Gdevelop	Game Engine
Photoshop	2D Art
Spine 2D	2D Animation
Nuke X	Compositing
Da Vinci Resolve	Video Editing

Figure 34: Technology resources

3.4.6. Planning

The proposed plan will serve as a **guiding reference** to propel the production forward. Given the common situation of uncertainty often encountered at the project's ideation, where there may be unknowns regarding both theories and technical challenges, the initial phase of Prototype V1 will heavily emphasize research and development. During this phase, the team will concentrate on addressing these uncertainties and laying the groundwork for the project.

As the project evolves, a more detailed **Gantt chart** will be implemented for Prototype V1. This stage will be oriented towards actual **production** and will be informed by the insights gained during the initial research and development phase. This stepwise approach ensures that the project evolves in a structured manner, allowing for effective progress and adaptation as the team moves from ideation to concrete production.

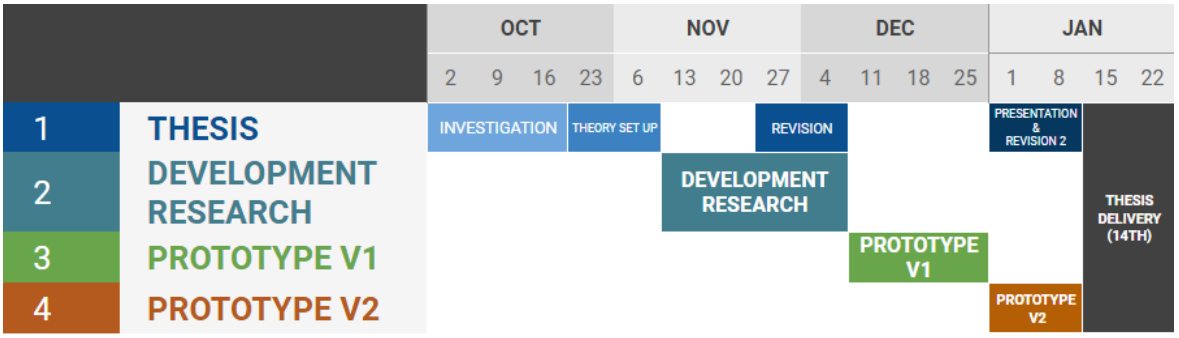


Figure 35: Proposed planning

3.5. Market analysis

3.5.1. Referents and competitors

Chirality draws **inspiration** from classic games like **Silent Hill** and Resident Evil, incorporating elements such as a third-person perspective, **deliberate combat pace**, and **inventory management.** Additionally, influences from GTFO are evident, particularly in the incorporation of **stealth mechanics** related to sound and a **cooperative gameplay** approach. The **narrative style** also aligns with games such as **Dark Souls**, adopting a storytelling method where the plot is discovered through gameplay and subtle pieces of information.

In the horror cooperative and extraction shooter genre, primary competitors include the recently developed **Lethal Company** and, to a lesser extent, **Phasmophobia**. Both games offer immersive experiences, incorporating proximity chat and shared objectives among players. Notably, they feature formidable enemies that may be difficult to defeat or are outright invulnerable. However, these games distinguish themselves from the previously mentioned inspirations by adopting a faster-paced gameplay style and infusing comedic timing, especially when played with friends.

Chirality's anticipated final version aims to distinguish itself in the horror and extraction shooter genre by introducing a **unique blend of narrative and survival horror elements**. Departing from recent market trends, the game offers a **serious and hardcore gameplay style**. Emphasizing more enemy variation, real time map changes and the possibility of player versus player situations, similar to Dark Souls invasions mechanics, therefore more careful planning, cooperation, and communication where the players will engage in a fresh, distinctive and immersive gaming experience.

3.5.2. Note about the analysis

An important point to note is that the **analysis** provided in this document **references the year 2023**, but the data and information available are limited to the period up to 1st of November of the same year. As a result, any subsequent developments or changes beyond that date are not incorporated into the analysis. It is advisable to consider this time constraint when evaluating the accuracy and relevance of the provided information.

It's essential to keep in mind that the analysis provided is an **estimation of the market reach** and conditions prior to the technical demo's launch. Developers typically work with data that may be a year or more outdated by the time their technical demo is released. The gaming market is a dynamic and ever-evolving landscape, with changes, shifts in genre popularity, and the emergence of unexpected hits. As a result, market conditions and player preferences can vary significantly between the time of analysis and the actual release.

In conclusion, it's important to acknowledge that some of the data analyzed may have minor inaccuracies due to the tagging system on Steam not always being entirely precise. An example is "Gorilla Tag," which is categorized as "Psychological horror" despite being an online VR action game.

Nevertheless, the data presented in the analysis provides valuable insights into the gaming market and is a valuable reference point for making informed decisions.

3.5.3. 2022 Analysis

If we use the data from Chris Zukowski in several of his marketing blog posts, we can see that **horror games show no signs of stopping being a trend** (2023).

In his blogpost *Every Indie Game Developer Should Make A Horror Game*,valuable information about how horror performed in the year 2022 is presented and can be used to understand the current state of the Horror genre (2023).

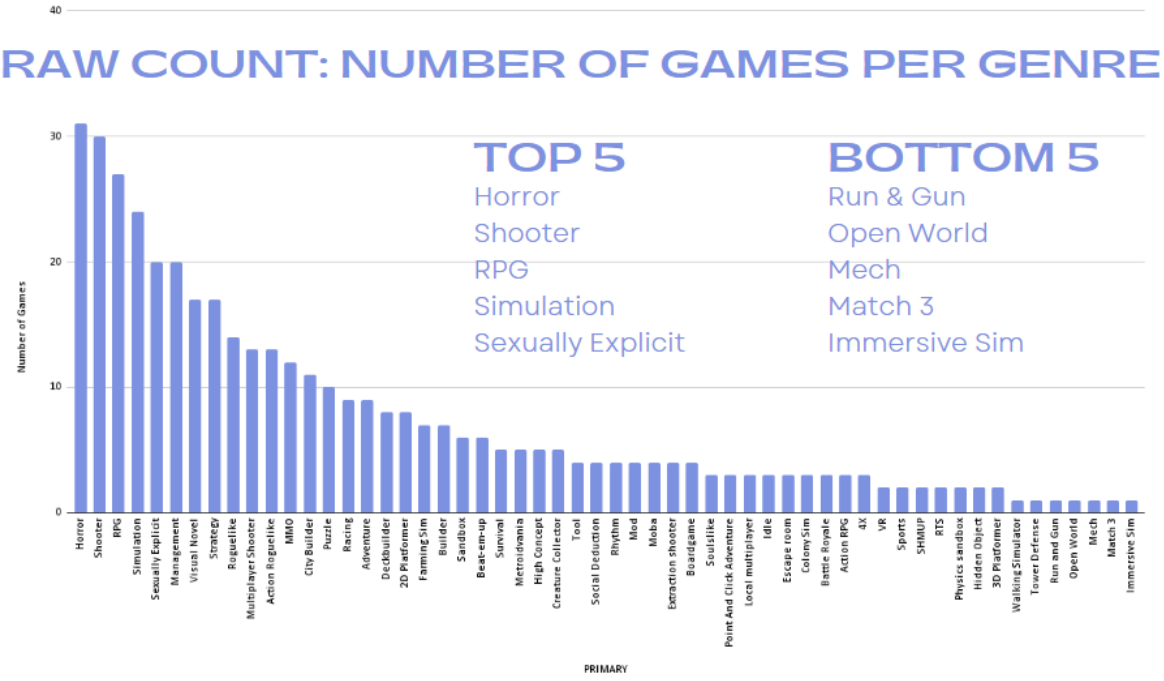


Figure 36: Number of games per genre

Source

He also shares the following data:

	Games Tagged Platformer	**Games Tagged Horror**
Number of total games released in 2022	1428	1,341
Number of games in 2022 that got 1000+ reviews	32	88
Percentage of games that go 1000+ reviews	2.2%	6.5%
Median revenue	$467	$1,200
Median revenue for >$9.99 games	$5,810 (348 games)	$13,271 (363)

Figure 37: Median revenue comparison

Source

Although the comparison provided may seem polarized, with platformers being characterized as one of the worst-sold types of games on Steam, the overall data and insights presented are still optimistic and positive (Zukowski, 2023). This observation suggests that despite variations in the performance of different game genres, **there are opportunities for success within the horror genre**, which is supported by the data.

The concluding statement in the article indicates that even though horror is one of the most popular genres on Steam, there is still a **6.5% chance of achieving success** within the genre.

The second statement about releasing one horror game per month with a 72% chance of getting a hit is intriguing. However, it's important to approach this assertion with caution, as success in game development depends on various factors, including quality, innovation, and market dynamics. While frequent releases may increase visibility and opportunities, it's not a guaranteed path to success. Careful consideration and a focus on delivering compelling and unique horror experiences remain crucial for indie developers in the genre.

3.5.4. 2023 Analysis

As of November 1, 2023, the Steam market reflects a dynamic landscape, with a substantial number of game releases. Specifically, there have been a total of 12,153 (SteamDB, n.d.) game releases on Steam during the current year, highlighting the continuous growth of the platform's offerings. Among these releases, 1,360 games fall within the horror genre. A total of 9.9% of all Steam Games (Game Stats, n.d.).

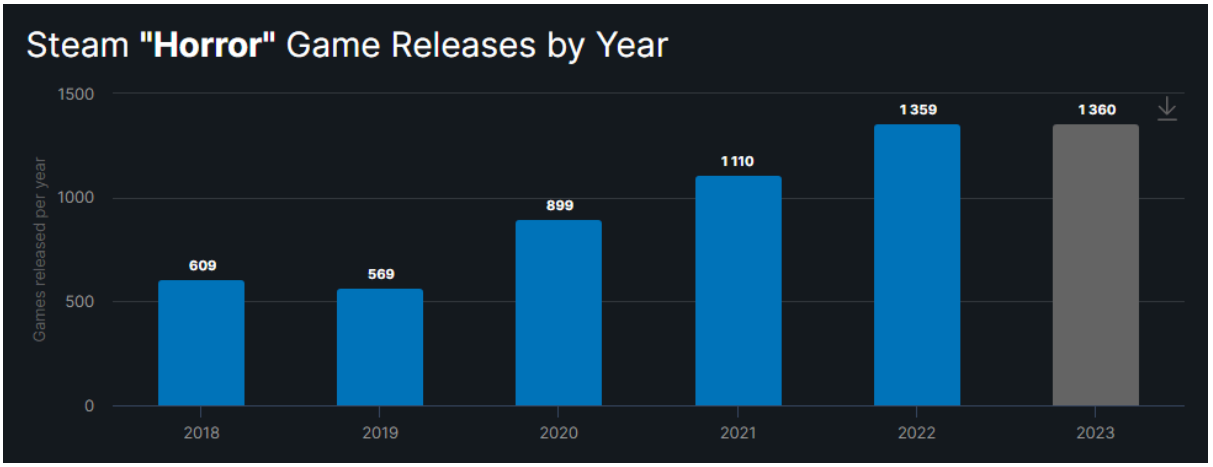


Figure 38: Horror game releases per year

Source

In comparison to other genres such action or strategy, the horror genre continues to represent a smaller portion of the total yearly game releases on Steam. This comparison highlights the relatively niche nature of the horror genre in the gaming market, with slightly fewer horror games released annually in contrast to other popular genres.

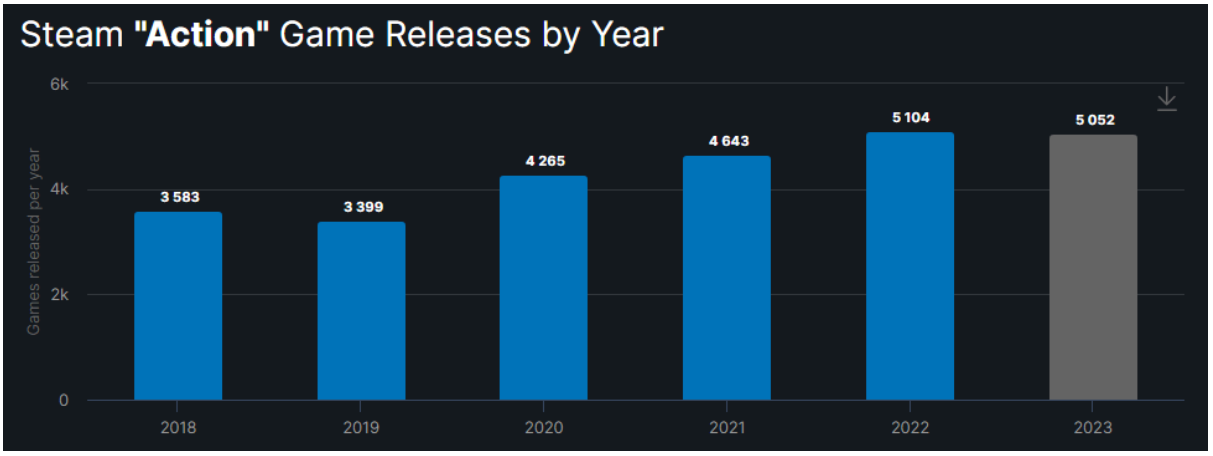


Figure 39: Action game releases per year

Source

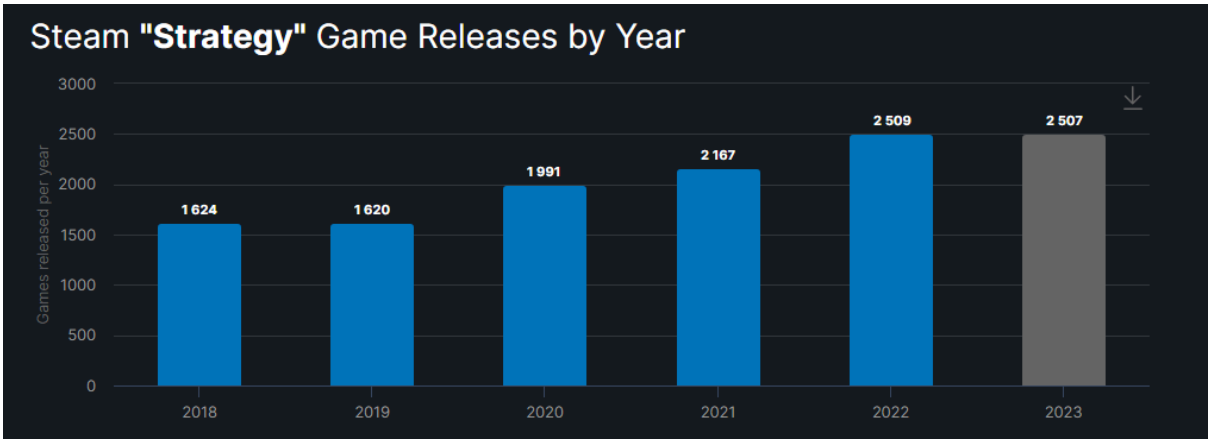


Figure 40: Strategy game releases per year

Source

Based on the analysis of data related to games with the "horror" (SteamDB, n.d.)tag on Steam, the following statements can be made:

1. Approximately **1,550 horror games** have been released up to the analysis date.
2. Out of this number, **716 have been developed by indie** teams.
3. Among these 716 indie horror games, 589 have a price exceeding 10 cents, with **144 priced above 9 euros**.
4. Of the 716 indie games, 108 have received **at least 10 reviews (299** when excluding the "indie" tag).
5. Among the games with a minimum of 10 reviews, **267 have achieved at least a 60% positive review** rating on Steam.

As a result, approximately **17.29%** of the horror games that meet these criteria **can be considered a success**.

The rationale for considering 10 reviews as a benchmark for success is based on the use of the *Boxleiter Ratio* (Video Game Insights, 2021), which serves as a valuable tool for estimating the number of units a Steam game has sold. This estimate, while an approximation, has demonstrated its effectiveness for over 80% of games on Steam, indicating that it reliably corresponds to roughly 30 times the actual number of reviews.

These statistics suggest that almost 20% of horror games have the potential for success, as evidenced by positive reviews and a substantial number of reviews. This is a promising figure, further supported by the fact that only 42 games (Steam DB, n.d.) with Steam pages are expected to be released in 2024

Note that this fact doesn't mean that not only 42 games are being developed for 2024, this is only the ones that have a Steam page. This means that the amount of horror games being developed is mostly unknown and its number is probably a lot higher.

Despite that, the analysis suggests a competitive but potentially rewarding landscape for indie horror game developers.

4. Project Development

4.1. One Page Documentation

Name	CHIRALITY: The First Journal
Genre	Extraction -Survival-Horror-Shooter
Platform	PC and Mac (Steam)
USP	New take on the popular genre of extraction shooters with a heavy narrative, survival-horror double twist that can be experienced alone or cooperatively.
Logline	In the remote mountains of Western Europe, scientists stumble upon an ancient sundial unlocking a passage to a mirrored reality known as Aubaga. Following weeks of silence from the team on the other side, a young researcher is assigned to navigate Aubaga and retrieve crucial information. Her mission turns deeply personal as she aims to find her lost brother in a colossal maze of ever-shifting, nonsensical rooms, haunted by the twisted forms of her once familiar coworkers.
Main mechanics	• 2D Third person shooter. • Limited inventory. • Dynamic map with shifting corridors. • Souls-like approach to combat.
PEGI	
Links	• Google Drive A • Google Drive B
About	Note that some of the mechanics relevant to an extraction shooter will not be present on the demo, due to the short period of development and due to the relevance of said systems to the document.

Figure 41: One Page proposal

4.2. Narrative Documentation

4.2.1. Before starting to read

Chirality's narrative delivery method is designed to immerse players in the game's story through **small, integrated pieces of lore** within the gameplay and level design. This approach avoids lengthy text/cinematic exposition by using instead, object **descriptions**, scattered **notes** throughout the game and storytelling through the visuals and level design.

The primary objective is to take advantage of the paranormal, therefore mysterious, context of the story and the use of historical symbolism to create an atmosphere of enigma and a **perpetual** sense of experiencing the "**unknown**" in order to prevent players from anchoring themselves too firmly in their perceived realities.

Some parts of the **lore will be obscured** as [REDACTED], in order to:

a. Stimulate the player's imagination by hiding locations, numbers (Only with non-important information)
b. Hide important information that will be revealed in further exploration of the game or that will be manually discovered by the player.

This narrative style aims to enhance players in the joy of exploration, making the process of uncovering the story an inherent and enjoyable part of the gameplay experience.

4.2.2. What is this document for

The following information was created with the intention of **aiding the concept's artists** in their art and to give a basis of the lore for the level designer to work with through the level. The story of the game will leave blanks purposely in order to be filled with the deduction of the player. Names, dates, places and other specific information will be obscured with the objective of incrementing the **uneasiness of the story**.

The story will also use the **misinformation technique** in which real scientific terms and data might be used in conjunction with **fabricated events** or terms (Technobabble) with the objective of making the event feel "real" to the player. Two truths and a lie, could be said.

4.2.3. Synopsis

A group of scientists discovers an **anomalous sundial** linked to an ancient mirror, granting passage to an **alternate reality** for individuals with specific genetic traits. Following a tragic accident, a young researcher **is tasked with retrieving information** on navigating this parallel realm. Her mission becomes deeply personal as she seeks to find **her missing brother** on the other side.

4.2.4. Context of the world

The year is 199X. In a world where the communists won the second world war, the atomic bomb was never created and the digital revolution never happened, a group of archeologists and scientists from Western Europe discovered an ancient sundial located within an underground cave of the Pyrenees close to the town of [REDACTED]. The object was inscribed with cuneiform symbols reminiscent of those present on Sumerian tablets and it was found much later to have several anomalous properties.

4.2.5. The anomalous dial, tree and the rooms

The cuneiform inscriptions on the dial were deciphered to represent a **four-dimensional coordinate axis,** including two additional cardinal directions known as "Ana" and "Kata".

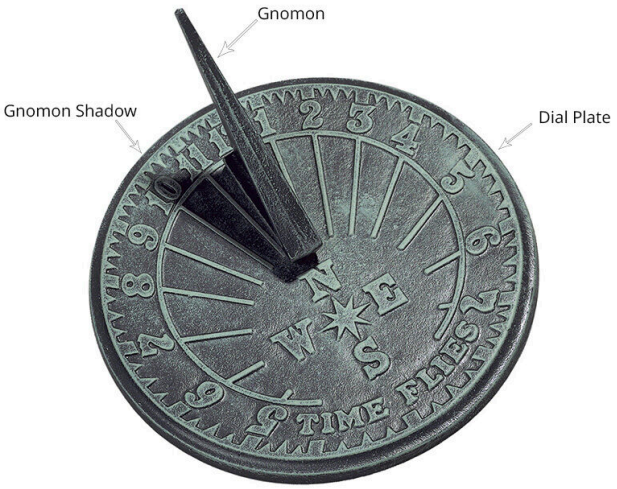


Figure 42: Example of a sundial

Source

The object was discovered within the **entrance of an ancient structure**, which strangely, was surprisingly **conspicuous** and its **architecture was fused with the walls** of the underground cave. These walls were adorned with **cuneiform** inscriptions, though much of it had been eroded by saltwater damage. What remained hinted at a prophecy, reminiscent of the biblical tale of the **Great Flood,** although the specific time frame didn't match current biblic versions, hinting time frames close to 1[REDACTED].

After further exploration, on the southern wall of the first discovered room a two-meter-tall carving depicting a **Huluppu tree** was found. This carving, severely damaged, **missing most of its branches**, was found to be made of an ash amalgamation of several prehistoric trees, dating even before the [REDACTED] era. The foot of the symbolic tree displayed a **spiral never seen** in other Huluppu tree's representation.

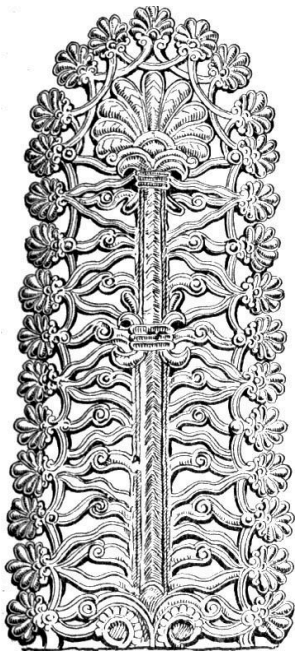


Figure 43: Huluppu tree

Source

The mineral structure of the walls of the room didn't match the composition of the landscape in a radius of [REDACTED] kilometers and despite the presence of indicators such as arcs, stairs or door holes to corridors seemingly leading to possible areas, the only usable spaces found was **one room at the end of a long corridor**. It contained an undamaged 1 square meter **obsidian mirror in the center of the room**, said mirror displaying no anomalous characteristics by itself.

The dial exhibited several **anomalous traits**:

- Despite having half of its gnomon broken, It proved **indestructible** and impervious to damage.

- It cast **inexplicable shadow aberrations** that were unaffected by light sources, often generating multiple shadows simultaneously.

- It displayed **partial biological properties**, akin to an ancient fungus. Radiocarbon dating indicated an astonishing age of over [REDACTED] years for the object.

- Upon direct skin contact with humans, lasting only three minutes, the sundial exhibited an anomalous **mnemonic effec**t. This effect resulted in the **precise recall** (As well as a constant visualization), by the individual in contact, of the specific positions and orientations of **mirrors** encountered within the past 72 hours.

4.2.6. The use of the dial

Following extensive exploration with the anomalous object, scientists made a peculiar discovery: the shadows cast by the dial were altered not only by mirrors, but any surface reflecting at least 79.6% of the light.

An unfortunate incident involving a young male intern mr. [REDACTED], led to the **subject's disappearance in the mirror room** with the dial. Approximately 72 hours later, the dial was seen expelled from the mirror (Despite said mirror being solid). The body of the male intern was **never found**. Subsequent tests revealed that the event could not be replicated by normal means and the mirror could only be activated with a **very specific set of individuals**.

1. 30% Of Semitic ethnicity, specifically **Assyroid**.
2. Males born from the 1st of October to the 13th of October.
3. Females born on the 3rd of September to the 26th of September.
4. Dial had to be held with the right hand by males.
5. Dial had to be held with the left hand by females.

Figure 44: Example of Assyroid ethnicity

Source

4.2.7. The conquest for the other side

Upon the return of the dial after the first incidents and after **several experimentation**, tests (With up to 17 casualties) were produced in the following order:

1. The volunteer stands up with the dial on the correct hand in front of the mirror.
2. The volunteer then proceeds to move into the mirror, upon passing, their reflection could be seen in the mirror, despite them not being present in the room.

3. Either:
    - The volunteer never returns. **Dial is expelled after 72 hours**.
    - The volunteer returns, with the dial in hand, unharmed.
    - The volunteer returns with dial in hand, physically and mentally harmed in a catatonic state.

4. The voluntaries that would return would describe similar experiences:
    - The other side's **architecture style didn't match** with the anterior one. The architecture was observed to be similar to **chaotic russian brutalism**, rather than a carved out cave.
    - The other side's **lighting was darker**, similar to the one tinted by the obsidian mirror.
    - It was a mirrored version of it, matching the approximate size of the room, but with distinctions, such as **the existence (or not) of other rooms or corridors**.

- Some kind of **fog** was slightly present in the air, with a constant smell of **sulfur**. On specific parts it made it impossible to breathe. Despite that, the long exposure to the fog hasn't been yet reported as harmful to humans.
- The **exterior was never found** seemingly out of reach. Despite the existence of windows, these could not be opened and the exterior could not be observed.
- **Corpses** from past casualties were found, but a portion of them didn't match the description of any of the volunteers.
- Upon coming back, some of the **volunteers** (One third) would express a **strong confusion** upon interacting with the rest of the team, expressing that some people had partially or totally physically changed. In a more extreme case one of the volunteers talked in an unknown variation of their mother tongue.

And finally, what probably influenced the chance of survival:

- The dial vanished from their hands and was found in the same room.
- The dial vanished and was found deep in the rooms and it helped them find the way back.

The **room layout** seems to only **change when not observed** directly and the cause behind these anomalous behavior on both the dial and the mirror is still unknown and needs more research. Said layout is deemed **impossible to measure**, always giving slight differences and making not much sense in terms of spaces, overlapping rooms, giving hints that the geometry of the other side was not euclidean.

The specificity on the subject it is speculated to be due to the actual summerian ethnicity, being assyroid. It was also observed that the following items could not be transported and would bounce off the mirror or be expelled violently upon pressure added to them:

1. **Anything containing an idea**, such as packaged items with labels, books, vhs, nametags…
2. Radio or any **means of direct communication**. (Though the components could be transported)
3. Animals or other **non compatible human** beings being held by the volunteer.

After several tests, a group of 22 researchers, 6 interns and 13 security personnel were able to **set base on the immediate rooms of the other side**, in order to study the paranormal event. The scientific team was mainly composed of dimensional physicists, environmental scientists and communication specialists. Due to the appearance of it, and the summerian origins of the rooms, the other side was labeled as "Aubaga" from local scientists.

4.2.8. The accident

In Aubaga, other obsidian mirrors were found. Despite the constant shifting of Aubaga, these appeared static and were even marked by the personeel as a means of mapping the dimension. At some point, **a broken mirror** was found.

A test, using the dial and the broken mirror shards, started, with the objective of **opening a permanent way to the normal world** (Hopefully). Said mirror was built in a room 500 meters to the north west of the original room, **within 2 mirrors of distance** (Mirrors were used as a way to measure distances as well).

Upon merging the shards it was discovered that **50% of it was missing**, resulting in a smaller version of the other mirrors found. Upon direct contact with the dial, **something** deep inside of Aubaga was **activated** and all of the personeel's biological body was suddenly transformed and adapted to a new form with no eyes, their souls seized and a new purpose given: "**protect the Ziggurat at all costs**" and due to their inability to see, all of the rooms shifted and expanded at the same time.

The being who activated the event was no other than th**e first person who disappeared** in Aubaga, the young male intern, rather a new being, **the Safeguard**, **fused with the obsidian crystals**, previously broken by accident, who searched actively for biological responses in the maze. After three days without communication, **the dial was expelled** from the mirror to the normal world and **another team was sent in**, this time only military personnel.

4.2.9. Who is the main character

Can be called Nadia, Kiara or Fatima. 31% Assyroid, Female, 26 years old, born on the 5th of September. A junior **archaeologis**t with **basic weapon training**, limited by her petite stature, making heavy weapons prone to jamming due to **recoil control challenges**. Her **brother, the first intern to disappear**, holds a crucial connection as they lost both parents during the [REDACTED] event, fostering a strong sibling bond. Witnessing the horrors of the [REDACTED] event instilled in her a resilient will and the ability to think pragmatically in distressing situations. Recommended by her brother, she is the sole individual with Assyroid genes tasked (And that voluntarily offered herself) with uncovering the **intel containing the secrets of navigating Aubaga** and **discovering the truth** behind the mysterious disappearances.

The main character is **not a real human** per se. She's a being created by the newly existing Safeguard in the image of himself. Due to the confusion, mixing of past memories and the amount of power it holds it created her as with the intention to to **recover his past human form**. Everytime her organic form is about to perish, **a copy of her will be created** next to the closest mirror, rendering her as immortal. **Consciousness is never transferred**, but copied onto other bodies.

4.2.10. What the player knows

At the start, the **player will be in the dark** about key elements outlined in the narrative. The **unraveling of secrets** will be a pillar on the environmental storytelling and the discovery of notes containing crucial details about the experiments and the true nature of the world. The initial piece of information granted to the player will be a **note from the protagonist's brother,** extending an invitation to join the team, as well as a photo of the two. This sets the stage for a journey of exploration and revelation as the player delves into the mysteries that lie ahead.

4.2.11. About the symbology

The Huluppu tree, signifying "The First Living Thing" or "**Mirrors are The Larger World**," (Hansen, 1995) carries profound symbolism. Aubaga, denoting "**The Dark Side of the Mountain**" in ancient Catalan, is entwined with the Mesopotamian concept of **Kur**, representing the underworld, which translates to "mountain." The Huluppu tree serves as a metaphor for the myriad **potential realities**, extending from **heaven to hell**, as indicated by the burned branches, leaving questions about the fates of these alternate worlds.

The room materializes within the world, seemingly an expression of the **tree's will**, imploring for assistance. The dial, exhibiting a form of volition, directs attention and reappears in the main room every 72 hours—a symbolic **approximation of the human endurance** limit without water. Both Aubaga and the tree embody **the esoteric consciousness of the past**, persisting in the modern world. What was once an infinite forest, where humans could lose themselves, has transformed into a labyrinth of cold, man-made architecture, reflecting a **loss of faith**. Across various faiths, the tree serves as a determinant of the entire universe's well-being, akin to its role in Norse mythology, and its destruction implies the annihilation of existence itself.

The brother, transformed into a new being, assumes the role of Humbaba/Huwawa, titled the "**God of the Fortress of Intestines**" (Monstropedia.org, 2007) echoing the archetype of the Minotaur. Ziggurats, reminiscent of the towers of Babylon, futilely aspire to reach the sky, embodying the **inherent human desire for transcendence**.

4.2.12. Endings

Ending A: The protagonist, along the intel, arrives at the **mirror without the Dial**. They get transported to another place of Aubaga, where they will see the exterior of Aubaga for the first time, an extensive dark landscape with giant ziggurats and massive shadows slowly moving in the background. Her eyes will start to bleed and the game will end.

Ending B: The protagonist will travel **back to the normal world with the Dial** and the intel. Assault personnel will be waiting at the entrance, not recognizing her. They'll be soon killed by the same being that was chasing her in Aubaga and disappear. The game ends.

4.3. 2D Art

4.3.1. Moodboard and references

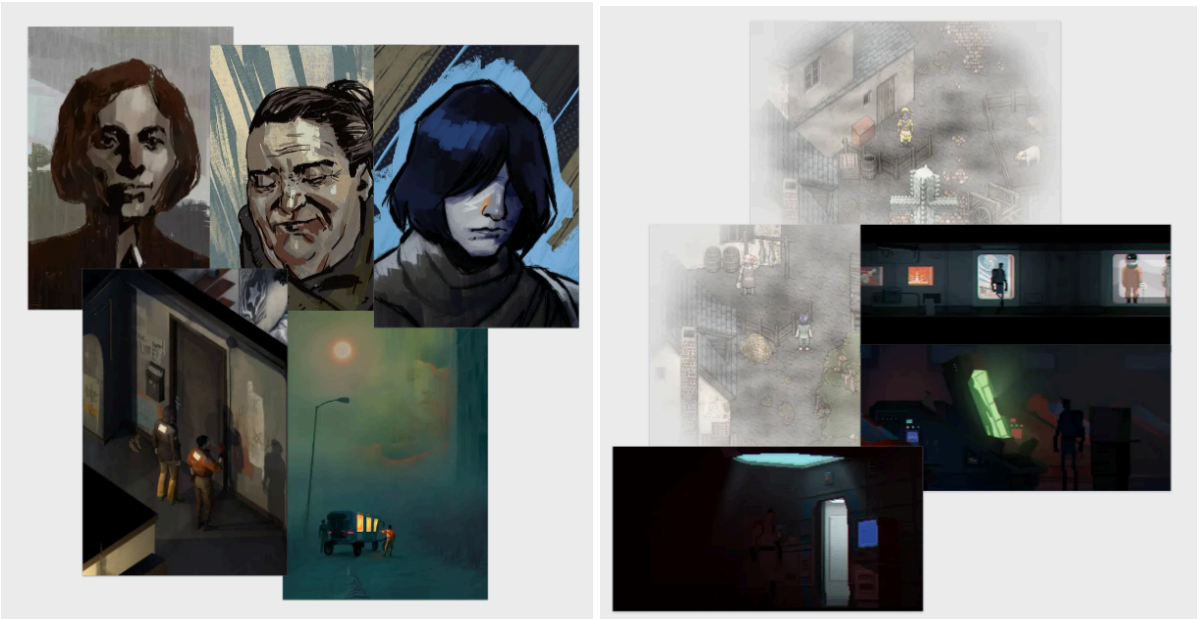


Figure 45: Examples of hand painted “Patchy style” and possible points of view.

Figure 46: Examples of mixed media overlay.

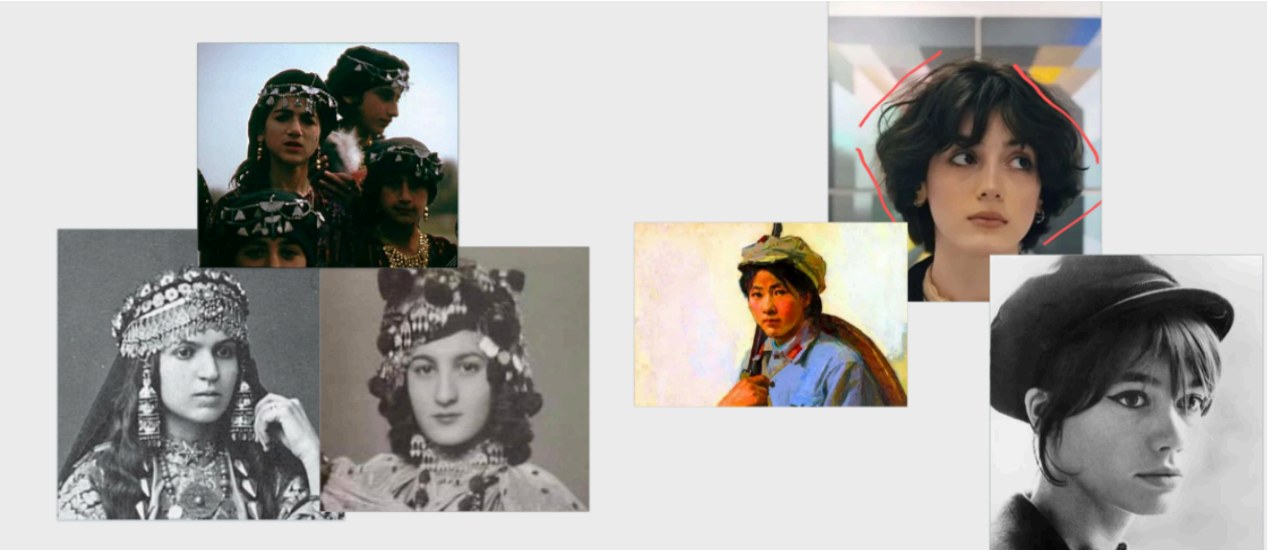


Figure 47: Facial structure and head shape references

Figure 48: References for the clothing of the protagonist.

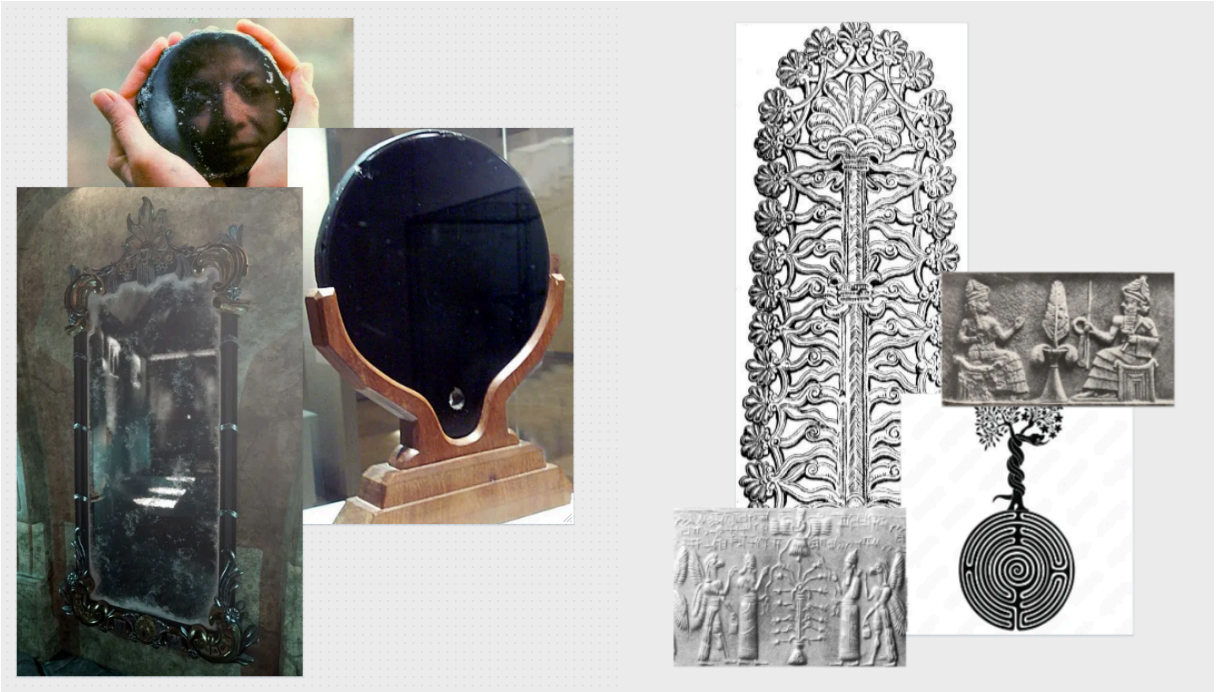


Figure 49: Examples of mirror and symbols.

Figure 50: References for the initial cave.

Figure 51: References for Aubaga and its analog props.

4.3.2. Character design

Figure 52: Sprites of the animations for all the characters

Figure 53: Main character first sketches

Figure 54: Clothes and color studies of the main character

4.3.3. Background design

Figure 55: Background concept art

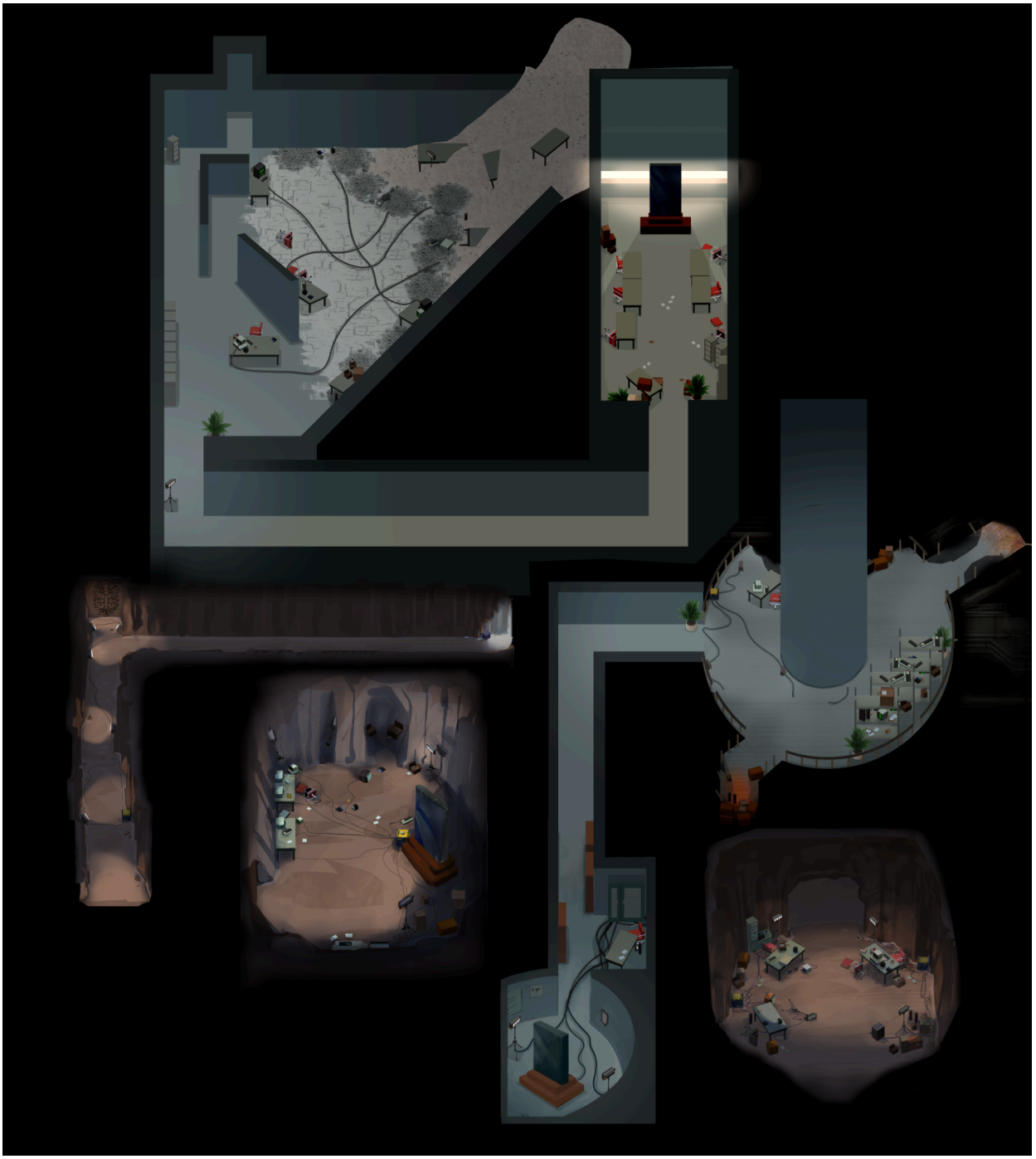


Figure 56: All resulting backgrounds of the demo

4.3.4. Menus

Figure 57: Main menu screen.

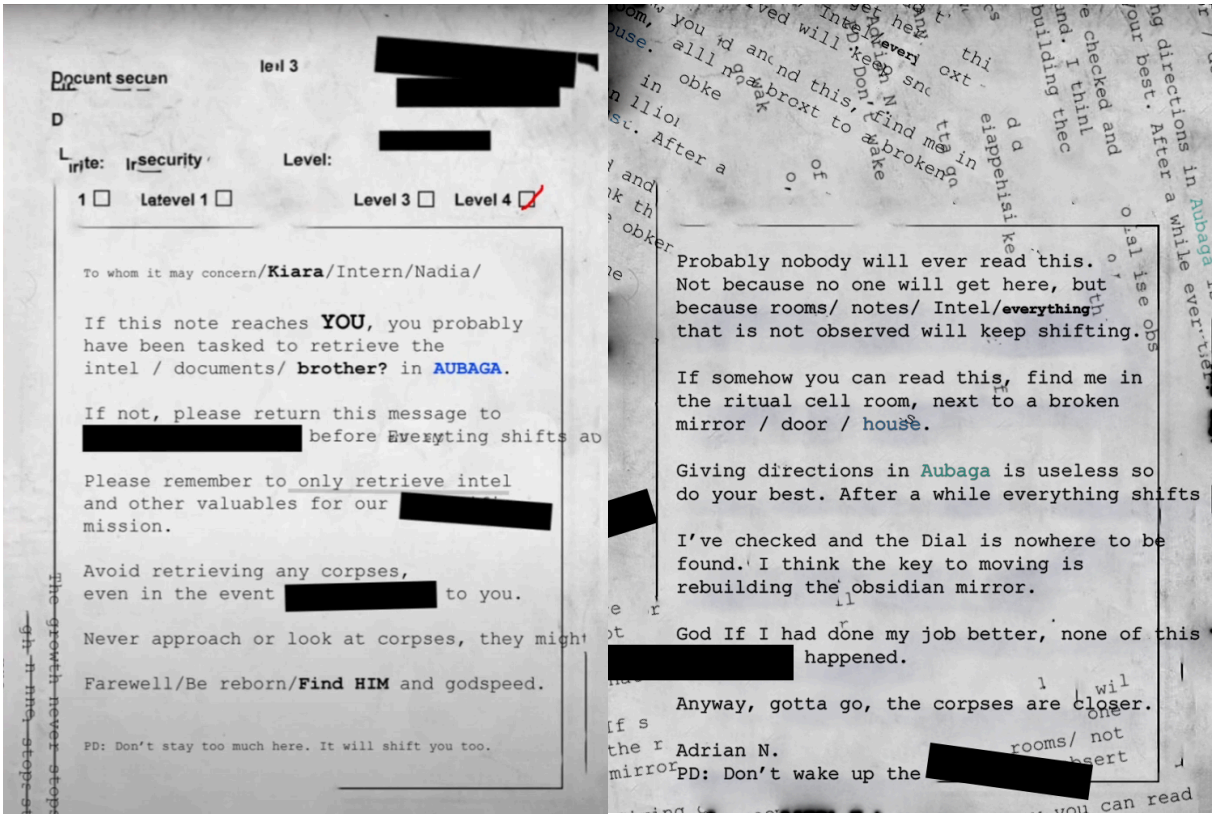
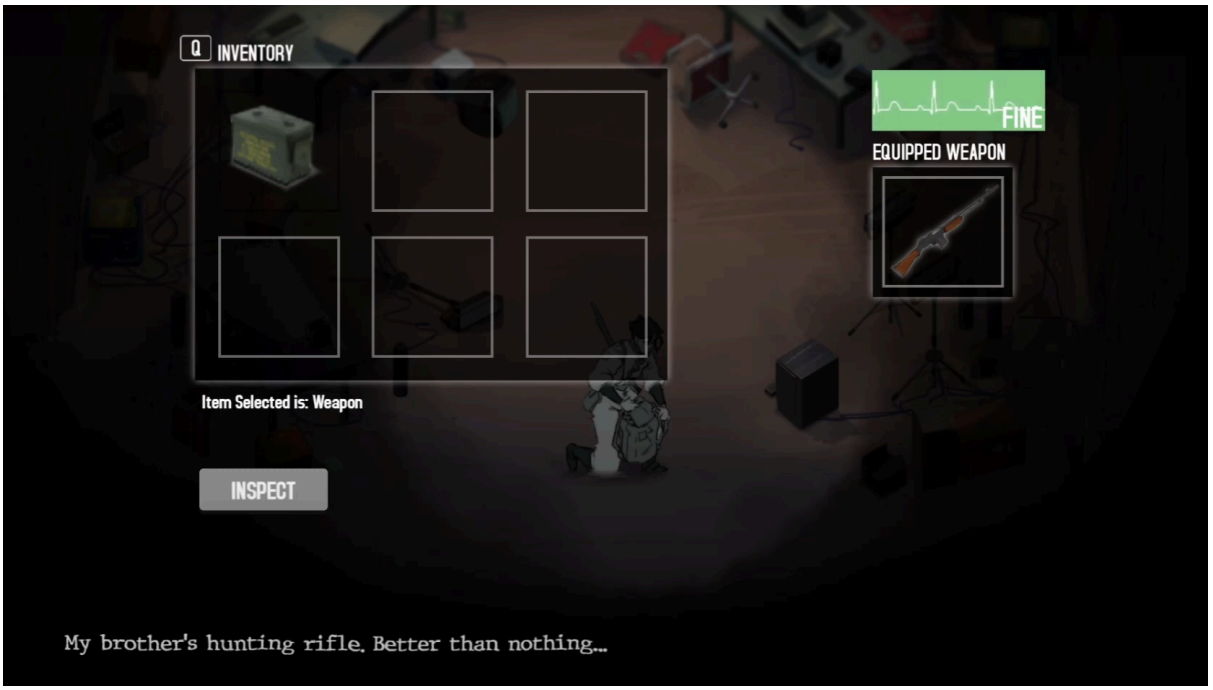


Figure 58: Examples of notes found through the game



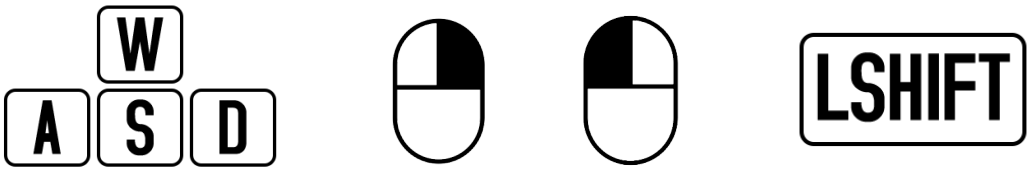


Figure 59: Inventory and tutorial images found in the demo.

4.4. Game Design Document

4.4.1. Controls

The player's actions will be managed with a separate object called "PlayerController". This object will be in charge of managing the **prioritization of said actions** with a state machine with the following states:

1. Hurt and Death State.
2. Combat State (Shooting, reloading and unjam weapons)
3. Interacting State(Opening inventory, doors and grabbing items)
4. Normal State (Idle, movement, shove)

States from above others will cancel states that are below. Parallel states will cancel each other. The controls will be the following:

Action	Keyboard keys	Gamepad buttons
Omni directional movement	W,A,S,D, Up, Left, Down, Right	Left joystick / Left Pad
Sprint	L/R Shift	L3 Button
Crouch	L/R Control	R3 Button
Interact	E	A Button (Bottom)
Aim State Toggle	Right mouse	Left Trigger
Shooting	Left mouse, when in Aim state and weapon is not jammed	Right Trigger
Push / Stomp	Left mouse, when not Aim state	Right Bumper
Unjam the weapon	Left mouse, when in Aim state	B Button (Right)
Reload the weapon	R, when in Aim state and weapon is not jammed	X Button (Left)
Open / Close inventory	Q	Back
Cancel / Go Back	Q	B Button (Right)
Movement in the inventory	W,A,S,D, Up, Left, Down, Right	Left joystick / Left Pad

Figure 60: Controls of the technical demo

4.4.2. Gameplay Loops and objectives

The technical's demo in-game objective is to **reach a certain point** inside of Aubaga, therefore, it aims to **assess the theories** and frameworks outlined in section 2.4 to determine their **impact on heightening the player's fear**. The objective in the final product is to retrieve items and intel back from Aubaga to the normal world, moving the narrative forward each time.

The **primary loop** during the gameplay will be the following:

1. Player enters a **room**.
2. They investigate in order to find **resources, the dial** or **saving points**.
3. The conflict (If there is any) is resolved by either **fighting/running** away from enemies or **resolving a puzzle**. If the conflict is not resolved, meaning that the main character dies, it will **respawn on the closest mirror** that doesn't contain enemies in the same room.
4. If the player has respawned, interacted with a mirror or any players are not present in less than 500 pixels of distance, the **corridors to other rooms will change directions** and connect to other rooms or to dead ends.
5. Go to a corridor to **find the other rooms**.

In addition, different secondary loops will give **long term objectives** and will be very clear through the game:

- Finding the Dial to go back to the normal world.
- Sell the found items and intel to gain money and improve their existent characters.
- Advance the narrative.
- Collect the parts of the broken mirror.

At the end part of the game, once the player has **collected all the parts of the broken mirror**, the primary loop will be modified to:

1. **Alpha Antagonist spawns** permanently and will chase the players through all of the map of Aubaga.
2. **Players are killed, losing** everything or they get out of Aubaga.
3. All the corridors will exist and connect at the same time, overlapped. The player will have to **find their way to the entrance**.

4.4.3. Mechanic and dynamic breakdown

PLAYER

Top Down Movement: Omni directional movement. Allowing sprinting and crouching with acceleration in order to simulate a real human movement.

Camera POV: Fixed camera view featuring different perspectives as well as movable camera view featuring top down or side scroller perspective.

Delayed shooting: Players can shoot, will have to aim their weapon before and actions will take anticipation before starting. Character's movement is slower when shooting. Bullet will come off and move towards the direction of the aim.

Shove/Stomp: Push/break away objects and enemies or stomp them when they are on the floor.

Investigate: The player can investigate any part of the world. By pressing the interaction button, the game will give back a text response, observing the environment, which can be a general comment or a specific reaction.

Health & bullet points: Players can die, bullets can run out. Initially the player has 100 health points and 6 bullet points.

Respawn: Players will be respawned back to specific parts of the level next to a lore-related location. The corpse will remain on the map.

Noise: Walking, shooting, using, makes noise and it's reflected in an invisible collision that will get big/small depending if the player makes more or less noise. This noise or the lack of, will be used to attract or hide from enemies.

Limited inventory: Objects can be stored or discarded (Deleted), excluding key items, such as the weapon. The inventory will have 6 slots.

Shifting / Saving: When in contact with the mirrors, the player will be able to touch it. If the player accepts, the map layout will be modified and the game saved.

WEAPONS

Manual reloading: Players need to eject manually and put the magazine/shells on the weapon with a timed event. If they keep trying to shoot, the weapon will just make a clicking noise. The minigame will consist of holding the reload key, and pushing specific buttons that the minigame will request in order. Once finished, the player will enter the "Aim" state.

Jamming: Weapons might jam, and need to be unjammed with a timed event. The minigame will consist of clicking the shooting button fast enough till a bar fills out. Once finished, the player will enter the "Aim" state.

ITEMS

Items: Ammo packs (Random value from 3 to 12 bullets), Health items (25 points each) and keys to open specific doors. These can be grabbed and manually inserted in the inventory with the interact key.

Locked Crates: Some crates need to be opened with a timed event, which when failed, will emit a strong noise that will increment the overall noise the player makes. The minigame is based on pressing the interact key in the proper time, shown in a bar with a green section and a square that moves left to right.

Flashlight / Darkness: Flashlight item can be found in order to illuminate dark parts of the level. The darkness will have 100% opacity when the place has not been observed yet and will go down to 80% once observed by the character, working like a fog of war.

COMMON ENEMY

Non-Aggressive/Aggressive state: Depending on a boolean variable specific for each spawned enemy, they can be totally idle or patrolling in random directions. If the invisible collider that the noise generates touches the enemy, they'll become aggressive and start chasing the player.

Attack: When close enough to the player, the enemy will attack in place, and remain static for 1 second. The attack will have 1 second of anticipation.

Health points: Variable points in small percentages. (All enemies have between 160 to 200 points) They can die, but their corpses remain on the floor and can still be shot or stomped on.

Knocked down: When a player has activated the shove attack on an enemy, these can get knocked down. There is also a 1/7 chance that the enemy will get knocked out from a bullet impact. When this happens, the enemy appears dead, but will get up in somewhere between 1.5 seconds to 3 seconds and start attacking again.

ALPHA ANTAGONIST

Chase / Attack: The Alpha will continuously chase the player and attack every 3 to 5 seconds, saving the player's position as a final direction and launching itself towards it in a straight line. After arriving at the destination, it will stop and attack in an area for 2 to 3 seconds.

Spawn/Despawn: The Alpha will be spawned or despawned with invisible collisions that will be hidden from the player. If the value of noise is below a specific number and the Alpha is not on camera, it will despawn as well.

Stagger: If shot three times, the Alpha will stop for 3 seconds and resume its chase.

4.4.4. Emergent strategies

Here are some foreseen dynamics that might occur due to the previously explained mechanic:

- **Resource management** due to both scarcity and inventory size.
- **Active strategy** based on current visibility, current resources and enemy placement from the player.
- **Obscured information** of how many life points the enemy and player have, how much damage is inflicted on both sides…etc.
- **Altered item respawn** depending on the player's current resources.
- **Fight/Flight decision** on knowledge of the map, current resources and enemy placement.
- **Intention to explore** in order to scavenge the resources necessary.

4.4.5. Gameplay beats

The technical demo will feature **two distinct play styles**, each providing contrasts to the others to modify the tension and dynamism of the level. These include:

- **Physical conflict** with enemies / Fleeing from Alpha Antagonist (for a more action-oriented style)
- **Puzzle solving** / World exploring (for a more narrative, relaxed style).

4.4.6. Aesthetics

The intended emotions to evoke are: **fear**, **hopelessness** and **impending doom**, and it aims to appeal to the following aesthetics:

Discovery: By the exploration of the branched rooms of Aubaga, discovering new resources and experiencing the different positions of the corridors.

Narrative: Intricate story that will gradually unfold and reveal itself throughout the course of gameplay by finding intel and small comments from the protagonist on her environment.

Challenge: Incremented by the artificial difficulty sensation that comes with the genre of horror itself.

4.4.7. Level sequence of the Technical Demo (Text)

Inside the cave, players have freedom of **movement** and can discover a piece of intel explaining the mission and a pack of ammo. This triggers the automatic **opening of the inventory**, allowing the player to inspect (or not) the weapon, revealing it belonged to the main character's brother.

Proceeding through a rock corridor, players encounter various directions at the end: a dead end with a Huluppu tree wall and a dark right turn. Here, players learn to use their **flashlight and firearm,** facing their **first enemy** feigning death. The first enemy requires three precise shots, prompting the player to **reload**. The corridor leads to a room with a mirror.

In the mirror room, a **dial** and **additional resources** are located near the entrance. Approaching the mirror opens the inventory, enabling the player to **use the dial to travel to Aubaga**. Upon arrival, a message states the dial is lost, along with all items, including weapon bullets. The new room is a smaller, mirrored version with brutalist architecture. Players can only access the corridor, discovering notes and inert corpses resembling the first enemy.

At the corridor's end, storage room C-F contains more notes and resources, alongside a disguised enemy upon the corpses that rises upon hearing noise. Near this foe, an **obsidian mirror piece** is found. Its discovery **shifts the previous corridor**, leading to the mapping probability office.

In the new corridor, another enemy awaits, followed by the new room (The probability mapping office) housing ammo packs, a health pack, notes, and a second obsidian mirror piece. A more **formidable enemy** is found in the center, **extremely reactive to noise** and capable of following the player through all the map. Dealing with it takes four to five shots. Acquiring the second mirror piece shifts the corridor, culminating in the final room, the Transit Ritual Cell which contains a mirror, a piece of intel, and the last obsidian mirror piece. Adding this piece to the inventory triggers the **final cutscene**, teleporting the player to a mysterious place, leaving the narrative with an unresolved question.

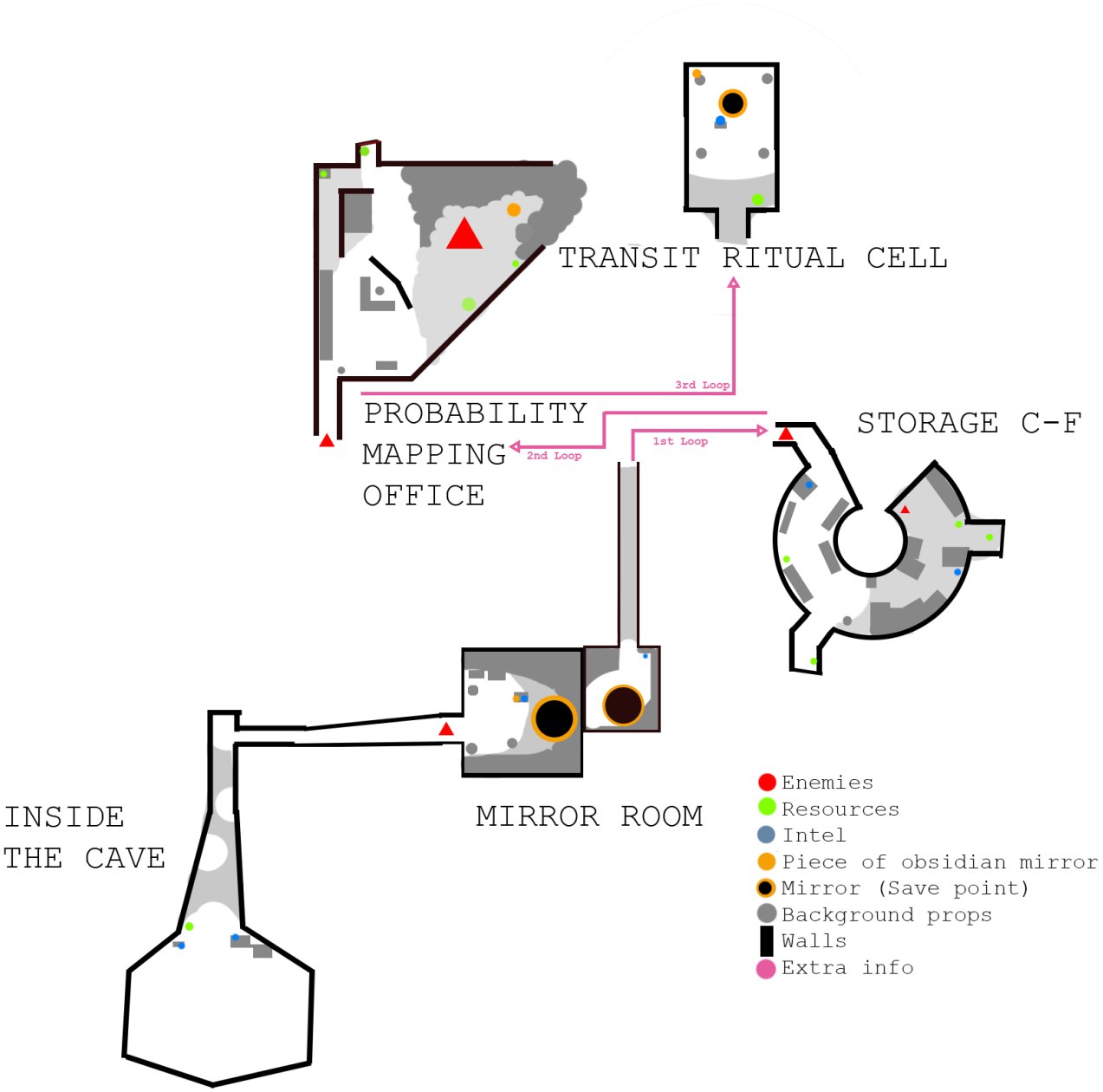


Figure 61: Graph of the level sequence

4.4.8. Proposal for the level sequence of the final product (Text)

Exterior, in **front of the cave**, the player is able to move freely and grab a piece of intel near the entrance. This will automatically open the **inventory** and after reading (or not) the intel, the player will be able to check another piece of intel; the letter from her brother, as well as a photo of both. An **empty map** will be found as well. This is done in order to teach the player about how the inventory and movement works in a **safe space** and mention briefly their **objective in the game**, through text, as well as rewarding minimum exploration.

Rock corridor that narrows down with different directions to choose at the end of it: one dead end that contains a wall with the Huluppu tree and a turn to the right with the room with the mirror. The Huluppu tree can be observed and the protagonist will comment on it. If the player decides, now or at any point from now on to check the map, they will find that the **map is drawing itself** everytime they move.

In the **room with the mirror**, The **dial** can be found close to the entrance, as well as other resources. When the mirror is approached, the inventory will open and the player will be able to use the dial in order to travel to Aubaga. This is the **first simple puzzle** the player will solve.

Once the player has traveled to Aubaga, a message will be displayed saying that the dial has been lost with its use. This **new room is a mirrored version** of the past one, but with a brutalist architecture design, instead of a cave. If the player decides to explore the mirror, the protagonist will mention that they cannot get back anymore, they **need the dial**, retrieve the intel containing the information of how to navigate Aubaga and moreover, **find clues of the whereabouts of the protagonist's brother**.

A **long dark corridor** stretches and an **enemy** is found at the end of it, near a source of noise. This will be used to teach the player how the game action works in a safe environment where they will learn that **enemies are attracted to noise** and also have space to retreat as they attack.

The player will enter a **room with another mirror (Save point)**. Upon entering, and when out of camera, the corridor where the player came, will disappear. All the corridors connecting other rooms will be hidden and the only way to progress will be by saving in this specific room. This will be done in order to teach the player that **that saving has consequences.**

The player now will be able to move through a **small maze** of **interconnected rooms** that change the order of its corridors everytime the player saves The dial will always spawn hidden in one of the accessible rooms (Changing place every shift) and the pieces of obsidian (Key A,B,C) (These being the different “keys· necessary to open a door in The Transit Ritual Cell room) can be found.

Once the keys A,B and C are in the inventory, the player will be able to **save in The Transit Ritual Cell Room**, where they’ll have access to a new room to get the intel that needs to be retrieved. The Alpha Antagonist will spawn in the same room, enemies will spawn in previously safe spaces and the player will have to run back to the original Mirror Room, where the dial will be.

Three things can happen now:

- Get caught by the Alpha Antagonist: The game would reset to the previous saving point.
- Shift (By not having the dial) triggers ending A.
- Exit the mirror room with the dial, triggers ending B.

4.4.9. Proposal for the level sequence of the final product (Graphs)

LOOP 0

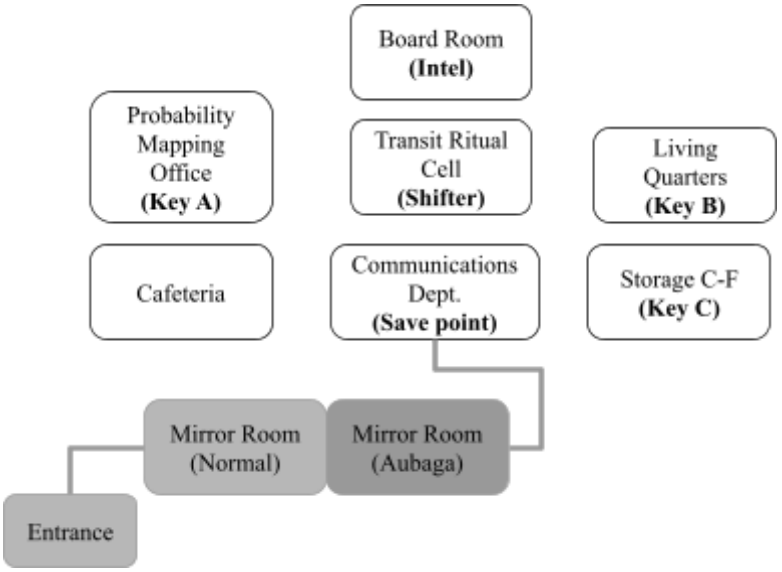


Figure 62: Loop 0 graph.

Room / Corridor	Information found	Resources	Enemies
Cave Entrance (Normal)	Observation about the abandoned material near the entrance. A note mentioning the need to send a message as soon as possible to get somebody compatible with the mirror in order to retrieve the Intel relevant on how exactly the mirrors work.	None	None
T- Junction at right angle (RT) between Cave Entrance and Mirror Room (Normal)	Observation about the visual state of the Huluppu Tree on the dead end of the corner of the intersection.	None	None
Mirror Room (Normal)	Note mentioning about the use of the dial to travel to Aubaga. Observations about the abandoned material. Observations about the cuneiform imagery carved in the walls, mentioning that she was	None	None

	told that it was referent about the great flood.		
Mirror Room (Aubaga)	Note mentioning to always retrieve back the dial in order to get back to the normal world. Observation about the slight smell of sulfur. Observation of the mirror about how she cannot get back without the Dial.	Saving Point (Mirror)	None
I-Corridor (IC) - Intersection between Cave Entrance and Mirror Room (Aubaga)	Observation to take the weapon to fight the enemy.	None	1 Enemy at the end of the corridor, next to a buzzing radio station.
Communication Dept.	A memo from the Probability Mapping Office showing the last current position of the corridors due to a worker missing 5 minutes to their shift in the transit cell. A short note advising from touching the mirror, which has caused previous random shifting of the corridors. An observation about how everything is impeccable, despite time passing from the last human intervention in Aubaga.	Saving point (Mirror). Dial (In the reception desk) 1 Health Pack.(If life is less than 50%) 1 Ammo Pack.	None

Figure 63: Loop 0 room breakdown.

LOOP 1

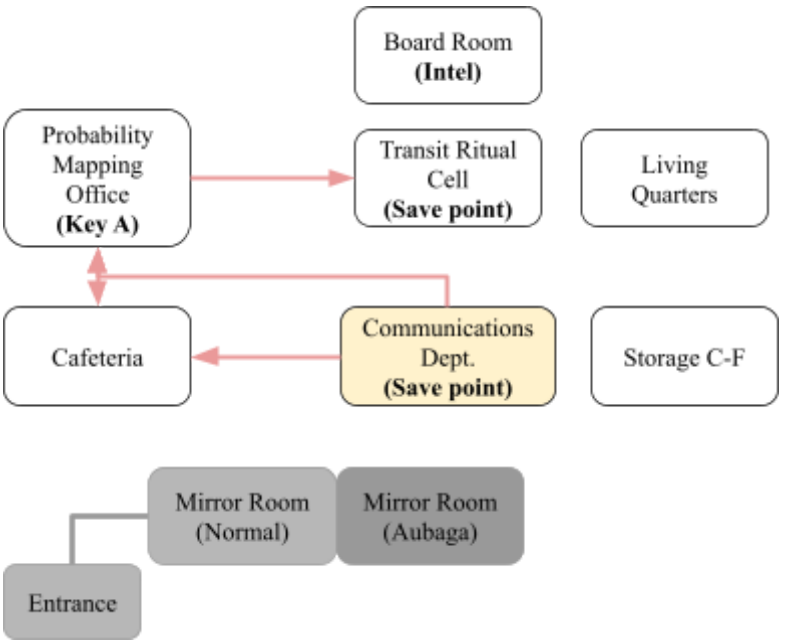


Figure 64: Loop 1 graph.

Room / Corridor	Information found	Resources	Enemies
Communication Dept. (Variation)	A letter mentioning that they're trying to pinpoint radio echoes from the Board Room, they seem to come from the missing intern's radio, but it is completely gibberish for some reason. The protagonist will react to this, being happy that she might find her brother. An observation about how the dial has disappeared again.	Saving point (Mirror).	1 Enemy next to the radio device.
Cafeteria	A note mentioning that the storage room cannot hold more food, asking who is ordering this many and that it is completely out of budget. An observation on how the storage corridor ends in a dead end. General observations about the good state of the food.	1 Health Pack (If life is less than 20%) 1 Ammo Pack (If ammo is less than 50%)	2 Enemies, next to the buzzing fridges.

		Dial (After observing a fridge in the corner)	
Probability Mapping Office	A letter scolding the worker who missed 5 minutes on their shift and caused the change of the corridors. Remembering that everytime that this happens, they have to draw maps again and send new memos. Remember them that the mirrors of the Transit Ritual Cell and the Communications Dept. must be watched at all times or rooms without current observation might get lost forever.	Key A	1 Enemy, next to the letter.
Transit Ritual Cell	Observation about the broken mirror.	Saving Point (Mirror)	None

Figure 65: Loop 1 room breakdown.

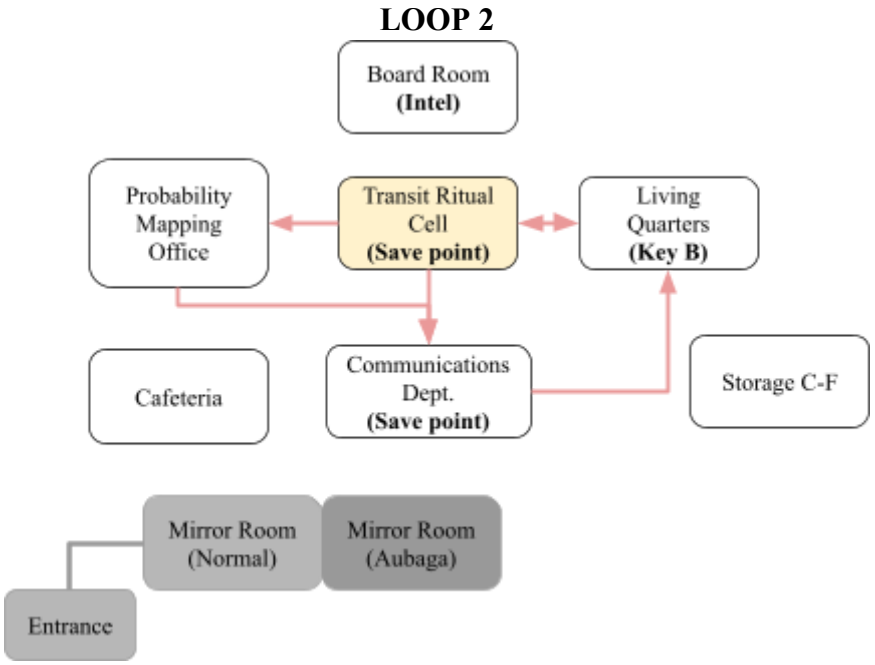


Figure 66: Loop 2 graph.

Room / Corridor	Information found	Resources	Enemies
Transit Ritual Cell (Variation)	None	Saving Point (Mirror)	None
Probability Mapping Office (Variation)	A memo showing the 5 different layouts of the map, mentioning that these are the most usual positions of the corridors and rooms. A scribbled note saying: The other side of the mirror is the bigger reality.	Dial (On the scribbled note)	None
Communications Dept. (Variation)	An observation on how the room has shrinked an all the furniture has collapsed one with another.	Saving Point (Mirror)	2 Enemies next to the mirror.
Living Quarters	An observation on a corner where it looks like someone has tried to live and survive for a long time, depicting years of waiting in the notes. Observation about a corpse that is fused to the wall.	Key B	1 Health Pack (If life is less than 20%) 1 Ammo Pack (If ammo is less than 20%)

Figure 67: Loop 2 room breakdown.

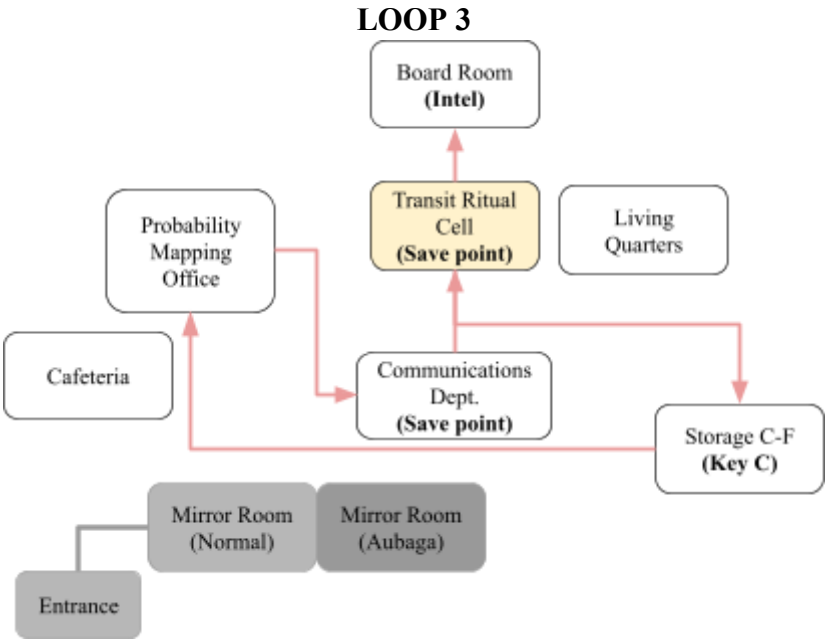


Figure 68: Loop 3 graph.

Room / Corridor	Information found	Resources	Enemies
Transit Ritual Cell (Variation)	Observation about writing on the walls in an unknown language. A corpse that is fused to the walls. It is still warm to the touch. It will disappear upon not being observed.	None	None
Probability Mapping Office (Variation)	A memo remembering the workers that the Board Room is not real and that any voices coming from the Transit Ritual Cell are mnemonic effects from the mirrors and Dial themselves. A letter talking about the Safe Guard and how it was activated, explaining how they should have never been there in the first place.	None	None
Storage C-F	Observation about the rotten smell. Observation about the bad state of the food.	Ammo Dial (Food compartment)	1 Enemy
Board Room	None		Alpha antagonist

Figure 69: Loop 3 room breakdown.

LOOP 4

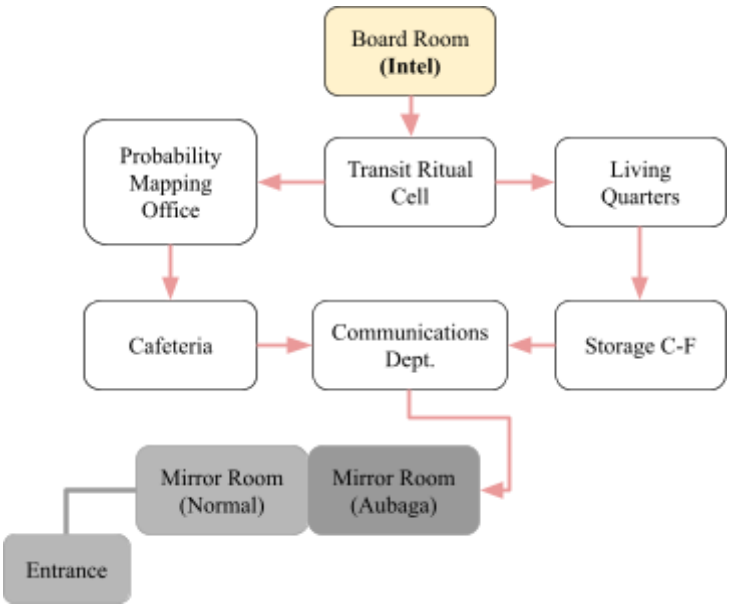


Figure 70: Loop 4 Graph.

Room / Corridor	Information found	Resources	Enemies
Amalgamation	All the rooms are clumped together through very small corridors. There is a mirror in the Communications Dept. There will be several observations based on the visual state of the map.	Ammo, Health, always dependant on the character's status	5 Enemies.
Mirror Room (Aubaga)	If dial is found, the player will travel to Mirror Room (Normal)	Dial (Hidden in one of the tables)	None
Mirror Room / Entrance (Normal)	None	None	None
Mirror Room / Entrance (Alternate)	None	None	None

Figure 71: Loop 4 room breakdown.

4.4.10. Level Floor Plan

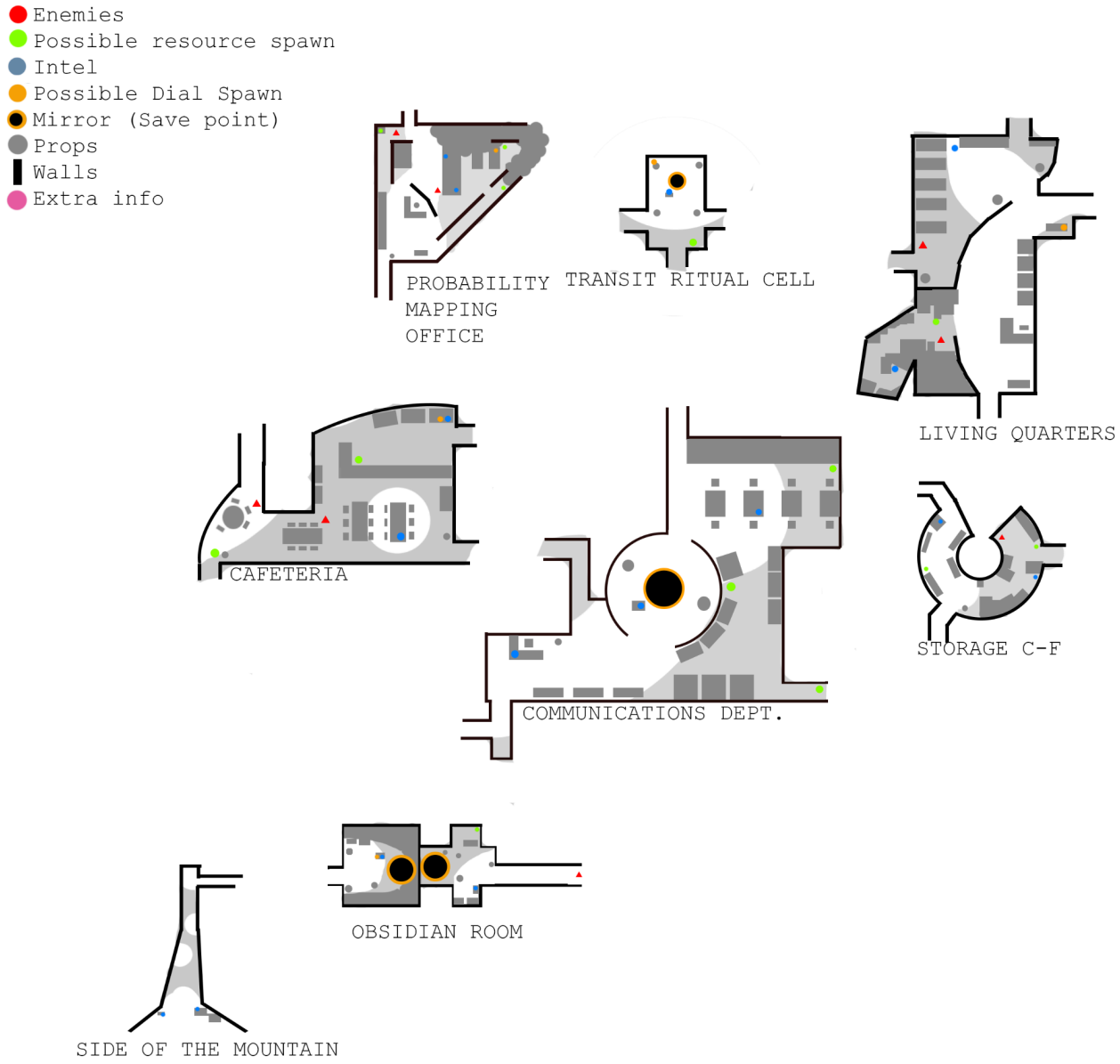


Figure 72: Floor Plan

4.5. Tests and Results

The technical demo underwent two iterations: **Prototype V.1**, a 5-minute gameplay test focusing on the tutorial and **shared exclusively with developers** and the internal team for developer-oriented feedback; and **Prototype V.2**, a 15-minute full gameplay demo aimed at refining and enhancing the overall player experience based on the insights gathered from the first iteration**, shared to the public.**

The second prototype comes with a survey in the format as a Google Forms and is given alongside the 15 minute technical demo. Even after the thesis has concluded, **the Forms will be present in the download link** so the author can continue gathering results after the study.

The current survey comes with five simple questions in order to **prove or disprove the effectiveness of the theories** posed in the section 2.5 conclusions, always trying not to lead the answer to the player. Said questions are:

- Did you feel hesitant to use health items?
- Did you feel scared at any moment?
- Did you feel that the inventory size was limiting?
- Did you feel hesitant to fight enemies?
- (Open question where they can write feedback)

The reach of the forms is at the moment of writing, 30 testers and the results are the following:

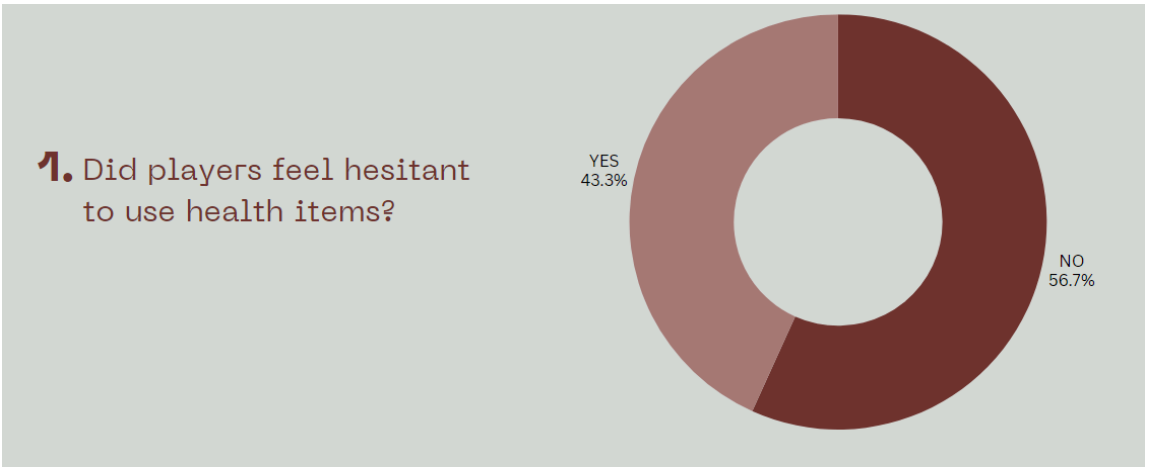


Figure 73: Question 1.

Did players feel hesitant to use health items?: Interestingly, many players didn't feel compelled to use health items. This is attributed to the current issue where interactions with enemies and their resolution are too binary—either the player easily survives or succumbs, depending on the player type. It is possible that if the inventory structure was developed with a different approach, such as a Souls-like rapid item use, players would have felt more tension as the number of health items decreased with each conflict resolution.

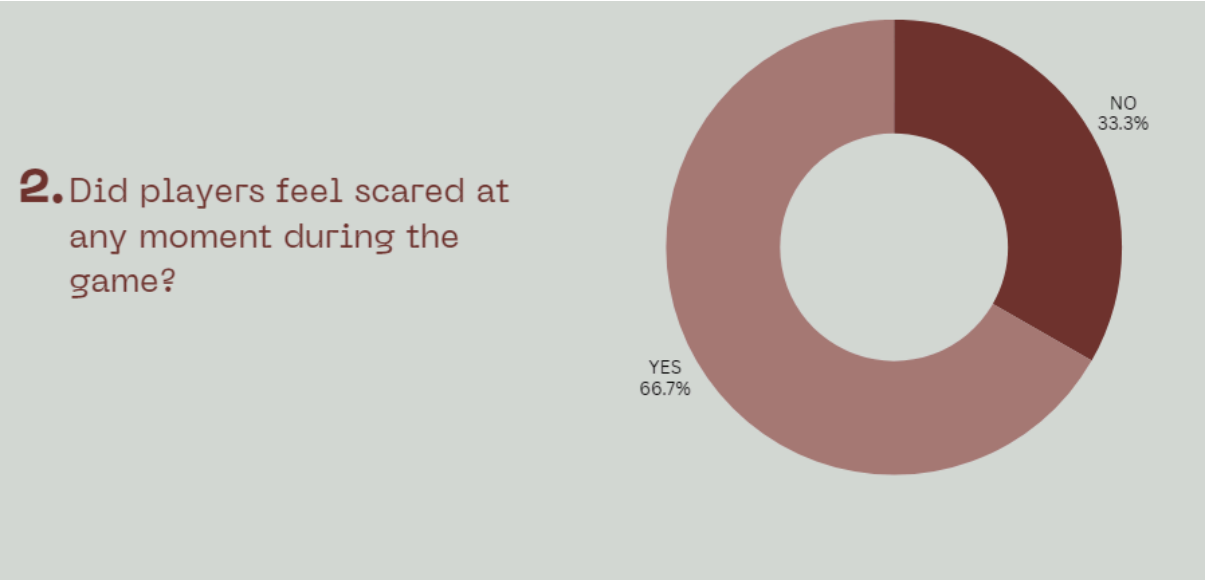


Figure 74: Question 2.

Did players feel scared at any moment during the game? While a significant majority of players experienced fear during gameplay, it's essential to acknowledge that 40% did not. The author considers whether this result is influenced by the player base, which predominantly consists of horror game fans or by the necessity to develop further iterations of the technical demo to refine the tension and release design within the level.

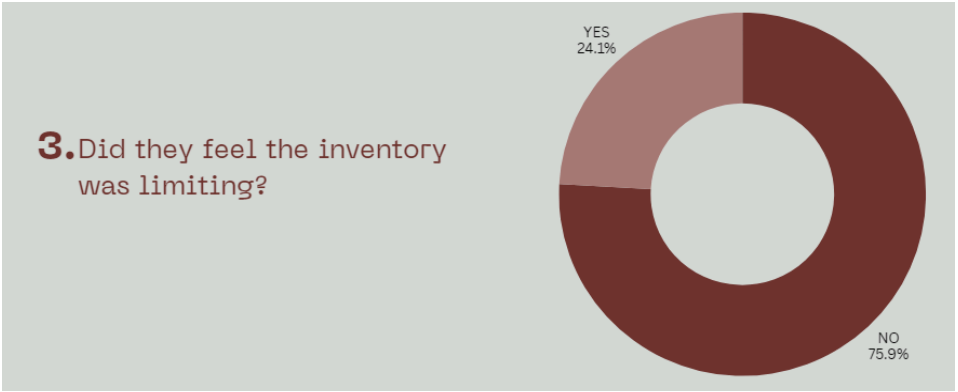


Figure 75: Question 3.

Did players feel that the inventory was limiting? The current inventory setup, consisting of six slots and ten objects scattered throughout the level, is not particularly restrictive. Considering the inclusion of consumable objects that serve offensive or defensive purposes, as well as introducing items like keys, could add more complexity. With increased variation, players may need to strategize more effectively. Further iterations in this regard are evidently necessary.

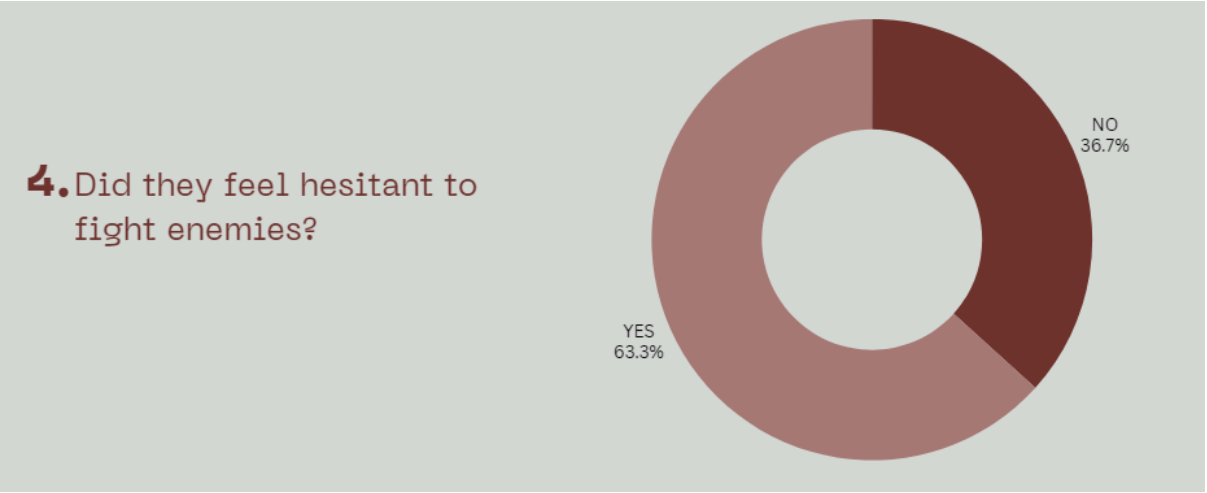


Figure 76: Question 4.

Did players feel hesitant to fight enemies? In this regard, the technical demo was quite successful, likely attributed to its short duration and the presence of fewer than five scattered enemies. However, there is a need to incorporate additional options to allow players to decide whether to flee or engage in combat, such as unkillable enemies, or enemies that can be easily avoided, warranting further testing.

In general, the results indicate that **the game was quite frightening for players**. Three testers, observed without developer interference, exhibited similar physical reactions—tensing up when facing enemies, particularly the dormant, sound-sensitive foe, and moving cautiously in unexplored areas.

However, the limited inventory and bullets' scarcity dynamics, despite working against the player, **did not appear as impactful as the others** in the results. This may be attributed to the demo's short duration or a lack of explicit demonstration of the positive effects of flight over fight. The player would be able to decide flight if the layout of the map had been shown before by either exploring or by a map.

In the open question segment, where players provided direct feedback, a predominant theme was the perceived **clunkiness of the fight mechanics.** While this clunkiness was **intentional**, the feedback suggests that **further refinement and testing may be necessary** to enhance the overall enjoyability of the combat experience.

To strengthen the presented hypothesis that the mechanics outlined in section 2.5 influence the horror experience, the next iteration could adopt **a more direct approach.** Emphasizing and **intensifying the inventory mechanic**, such as reducing slots dynamically or frequently leaving the player without bullets, might be effective. Alternatively, simplifying other mechanics and conducting separate tests could help confirm the proposed theories.

The study’s result can be deemed an interesting and good starting point for further studies, clearly pointing out that **mechanics and dynamics significantly impact the emotional states of the players.** Further documentation is warranted to ascertain specific percentages and delve deeper into the reasons behind these emotional changes. Incorporating additional open-ended questions such as "**Why do you think you felt that way?**" will contribute to a more comprehensive understanding of the player experience.

5. Conclusions

The primary objective of this document was to **identify and enumerate a set of mechanics and dynamics** influencing players' emotions, specifically **inducing feelings of horror.** Testing their effectiveness in a technical demo was undertaken to analyze and substantiate their impact, aiming to complement the typical aesthetics of the horror genre.

The theoretical framework study substantially **enriched the author's understanding of horror** games. Simultaneously, the rapid development of the technical demo expanded their **knowledge in game development,** offering a solid groundwork for future projects. This experience has not only contributed to enhancing the author's proficiency in directing and producing but also better positioning them to perform effectively for the team within the studio.

Despite successfully **achieving all objectives**, the research highlights the **necessity for further iterations**. Specifically, there is a need to develop **additional technical demos**, with focused attention on individual mechanics. This includes experimenting with the **removal of certain aesthetic elements** to better understand the player's emotional response in specific moments. Future iterations should integrate more **open-ended questions**, employing formats such as "What do you feel in this moment? Can you explain why?" **Recorded gameplay sessions** and a larger player base are also essential to ensure comprehensive insights and further validate the initial hypothesis in a more structured and direct way.

The time constraints inherent in working on a thesis project within a single semester mandated several reductions in the scope of prototype development to meet deadlines. Nevertheless, the project stands as a **valuable starting point** for the Slumber Party Games team in the ongoing development and refinement of Chirality. The team aims to **pitch the game to potential investors** in the summer of 2024.

The Slumber Party Games team has outlined specific areas for improvement and investigation in the mechanics of Chirality:

- **Enhance Lighting System:** The team aims to improve the lighting system, incorporating elements such as shadows and a combination of fog of war to add depth and atmosphere to the game.

- **Further 3D Testing:** Given the inherent limitations of the 2D design in the current demo, the team plans to conduct further testing in a 3D environment to address issues related to verticality.

- **Redesign Game Loop:** A complete overhaul of the game loop is on the agenda, aligning it with current market trends to ensure relevance and engagement.

- **Refine Visual Sound Mechanics:** The team intends to enhance the utility of the visual sound system by testing different styles and incorporating a tolerance level for enemy noise reactions. This adjustment aims to encourage stealth gameplay.

- **Improve Conflict-Resolve Formula:** Striking the right balance between accessibility and a souls-like fight system is a priority. Special emphasis will be placed on enhancing the game feel of enemy hit detection.

- **Develop Online Mechanics for the Lobby:** The team plans to create online mechanics for the lobby, fostering cooperative gameplay while also providing the option for player-versus-player (PVP) interactions.

- To **enhance the sound design of the game**, the team aims to introduce a new team member with a specialized role dedicated to crafting all the sounds for Chirality. This addition will ensure a comprehensive and cohesive auditory experience, contributing to the overall immersive atmosphere of the game.

- Generate **diverse proposals for the visual style** to align with the initial moodboard references.

In conclusion, this has been a **profoundly enriching experience for the author**, serving as **strong inspiration** to continue the development of Chirality: The First Journal with the objective to create a unique and horrifying experience that can be enjoyed both individually and with friends.

I genuinely hope that this document proves valuable to any developers undergoing the same initial search phase I experienced at the outset of creating this thesis, and that it serves as a useful resource for the creation of amazing games in the future.

I extend my sincere appreciation to the reader for investing their time in this document. For any doubts, comments, feedback, or discussions, please feel free to contact me through Linkedin, which will be found in the annex section.

6. Bibliography

Ager, R. (2008). *THE SHINING (1979) analysis by Rob Ager*. Collative Learning. https://www.collativelearning.com/the%20shining.html

Albrecht, K. (2012). *The Only 5 Fears We All Share*. Psychology Today. https://www.psychologytoday.com/us/blog/brainsnacks/201203/the-only-5-fears-we-all-share

Apperley, T. H. (2006). Genre and game studies: Toward a critical approach to video game genres. *Simulation & GuKлYaming*, *37*(1), 18. https://web.archive.org/web/20131005003753/http://trac.assembla.com/CommanderAssembler/export/32/docs/Genre%20and%20game%20studies%20-%20tom-apperley.pdf

Boonen, C. S., & Mieritz, D. (2018). Paralysing Fear. Player Agency Parameters in Horror Games. *Proceedings of Nordic DiGRA*, *2018*, 13. http://www.digra.org/wp-content/uploads/digital-library/DiGRA_Nordic_2018_paper_19.pdf

Boyle, D. (Director). (2002). *28 Days Later* [Film]. DNA Films, UK Film Council.

Bycer, J. (2018). *The Three Factors Of Effective Horror Design*. Game Developer. https://www.gamedeveloper.com/design/the-three-factors-of-effective-horror-design

Bycer, J. (2019). *How to design an Alpha Antagonist*. Medium. https://medium.com/super-jump/the-horrific-appeal-of-mr-x-af88c622faed

Bycer, J. (2021). *Game Design Deep Dives: Horror*. Taylor & Francis Group.

Carroll, N. (2018). *The Philosophy of Horror*. Iai News. https://iai.tv/articles/the-philosophy-of-horror-auid-1163

Cook, D. (2007). *Constructing Artificial Emotions: A Design Experiment*. Game Developer. https://www.gamedeveloper.com/design/constructing-artificial-emotions-a-design-experiment

Eisenmann, V. (2014). *PT Silent Hills Teaser Game Analysis*. Game Developer. https://www.gamedeveloper.com/design/p-t-silent-hills-teaser-game-analysis

Fritcher, L. (2023). *The Psychology of Fear*. Very Well Mind. https://www.verywellmind.com/the-psychology-of-fear-2671696

Health | Resident Evil Wiki | Fandom. (n.d.). Resident Evil Wiki. Retrieved November 8, 2023, from https://residentevil.fandom.com/wiki/Health_(RE2)

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A Formal Approach to Game Design and Game Research. *Proceedings of the AAAI Workshop on Challenges in Game AI*, *Vol. 4*(No. 1), 5. https://users.cs.northwestern.edu/~hunicke/MDA.pdf

Kirkman, R., & Moore, T. (2004). *The Walking Dead*. Image Comics. 1-58240-358-9

Kubrick, S. (Director). (1980). *The Shining* [Film]. The Producer Circle Company Peregrine, Productions Hawk Films.

Ntokos, K. (2018). Level of Fear: Analysis of Fear Spectrum into a tool to support Horror Game Design for Immersion and Fear. *Computer Game Development and Education: An International Journal (CGDEIJ)*, *1*(1), 11. https://www.researchgate.net/publication/338485879_Level_of_Fear_Analysis_of_Fear_Spectrum_into_a_tool_to_support_Horror_Game_Design_for_Immersion_and_Fear

Prokop, P. (2021). Universal Human Fears. In T. K. Shackelford & V. A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science* (p. 8605). Springer International Publishing. 10.1007/978-3-319-16999-6_2996-1

QPGames. (2015, August 26). *Until Dawn The Science Of Fear (Biometric Testing) PS4*. YouTube. https://www.youtube.com/watch?v=UGFFnfGbC1g

Schachter, S., & Singer, J. E. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, *69*(5), 379–399. 10.1037/H0038845

Vice, C. (2023). *Halloween Atari 2600 Review*. Indie Gamer Chick. https://indiegamerchick.com/tag/halloween-atari-2600-review/

Albrecht K. (2012). *The (Only) Five Fears We All Share*. Psychology Today. https://www.psychologytoday.com/intl/blog/brainsnacks/201203/the-only-5-fears-we-all-share

7. Ludography

Andersson, U. (Director). (2021). *GTFO* [Video Game]. 10 Chambers.

Anpo, Y. (Director). (2009). *Resident Evil 5* [Video Game]. Capcom.

Booth, M. (Director). (2009). *Left 4 Dead* [Video Game]. Valve.

Byles, W., & Bowen, N. (Directors). (2015). *Until Dawn* [Video Game]. Supermassive Games.

Dyack, D. (Director). (2002). *Eternal Darkness* [Video Game]. Silicon Knights.

Evans, M., & Greye, J. K. (Directors). (1981). *3D Monster Maze* [Video Game]. J. K. Greye Software, New Generation Software.

Fujiwara, T. (Director). (1989). *Sweet Home* [Video Game]. Capcom.

Gavin, J. (Director). (2021). *Mothered* [Video Game]. ENIGMA STUDIO, Dolores Entertainment.

Grip, T., & Nilsson, J. (Directors). (2010). *Amnesia: The Dark Descent* [Video Game]. Frictional Games.

Haverinen, M. (Director). (2022). *Fear and Hunger 2: Termina* [Video Game]. Happy Paintings.

Hope, A. (Director). (2014). *Alien: Isolation* [Video Game]. Creative Assembly.

Knight, D. (Director). (2020). *Phasmophobia* [Video Game]. Kinetic Games.

Kojima, H., & Del Toro, G. (Directors). (2014). *P.T. Silent Hills* [Video Game]. Konami.

Martin, T., & Barber, R. (Directors). (1983). *Halloween* [Video Game]. Wizard Video.

Mikami, S. (Director). (1996). *Resident Evil 1* [Video Game]. Capcom.

Panell, A., Richard, D., & Coté, M. (Directors). (2017). *Dead by Daylight* [Video Game]. Behaviour Interactive.

Petty, J. T. (Director). (2013). *Outlast* [Video Game]. Red Barrels.

Schofield, G. (Director). (2008). *Dead Space* [Video Game]. Electronic Arts.

Shibata, M., & Kikuchi, K. (Directors). (2001). *Fatal Frame* [Video Game]. Tecmo, Nintendo.

Straley, B., & Druckmann, N. (Directors). (2013). *The Last Of Us* [Video Game]. Naughty Dog.

Toyama, K. (Director). (1999). *Silent Hill* [Video Game]. Konami.

Raynal, F. (Director). (1992). *Alone In The Dark* [Video Game]. Infogrames.

8. Annex

ABOUT THE AUTHOR

Eduardo J. Reyes is a **Lecturer in Game Design** and other various subjects at La Salle URL in Barcelona. Additionally, he serves as the Co-founder and **Game Developer at Slumber Party Games** and is recognized as an Unreal Engine Authorized Instructor Partner for Epic Games.

With two years of experience in the indie games industry, his previous works include the **development of web games in collaboration with Prime Video** for popular series such as The Boys, Invincible, Fleabag, and El Internado.

As of the delivery of this thesis (First quarter of 2024), Eduardo is actively working to enhance his game design and development skills, continually building his portfolio through each project.

He is also deeply passionate about martial arts and currently manages a university club at La Salle URL, providing free training opportunities for anyone interested.

Can be contacted through Linkedin, Discord (User: eduardoj.reyes) or e-mail.

Most of his works can be found in the Slumber Party Games website or his Youtube channel.