



ANALYSIS OF THE DESIGN AESTHETICS AND PLAYER EMOTIONS OF HORROR GAMES

Take 'Little Nightmares' as a case

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Abstract

What makes horror games different from other games is that they bring a special kind of emotion to the player and cause fear in the player. In horror games, players experience great emotional experiences and may experience different emotions such as anxiety, tension, and satisfaction. This paper aims to study and analyze how different players react to and emotionally experience fear, how players derive satisfaction and discomfort from horror games and the reasons that produce these factors. The study uses interviews and biometric data to examine the differences between players familiar with horror games and those who have less experience with this particular type of game. It was concluded that the number of experienced players with horror games also influences the comfort and discomfort, and mood changes players get from the games.

Keywords: horror games; design aesthetics; player emotions; player experience

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1 Introduction

Video games are genuinely interactive spaces that elicit complex emotional responses, and users turn to them for new emotional experience (Graja, Lopes & Chanel 2020). In video games, users can experience different emotional experiences from them. Horror games are one of the game genres that can evoke complex emotions in players. Horror games can cause a variety of uncomfortable emotions such as anxiety, fear, depression, guilt, sadness, and nausea (Gowler & Iacovides, 2019). Demarque and Lima (2013) mentioned that although fear is often understood as an unpleasant emotion, it is sometimes used for entertainment purposes. Today, the increasing number of people looking for horror games and the increasing number of new games released each year that focus on horror stories show the effectiveness of fear in entertainment. The experience of playing a horror game may well make the player uncomfortable, but little attention is paid to those negative experiences given to the player.

Theoretical developments over the years have shown the emotions of satisfaction and discomfort in horror games. Gaining a better understanding of the satisfaction of scary game experiences may expand our conception of the player experience, therefore, may help explain why people seem to be drawn to scary experiences in digital games (Endress, Mekler & Opwis 2016). Players' uncomfortable experiences may jeopardize their engagement, but uncomfortable experiences often promote a richer gaming experience (Gowler & Iacovides, 2019). Ntokos (2018) discussed a scale that goes on to define segments of horror games to understand the level of fear they can bring, suggesting that developers adopt this scale as they see fit.

In some horror video games, stylized character scenes and scary narrative plots provide players with a thrilling and immersive experience. Demarque and Lima (2013) provide an appealing way to stoke players' fears through auditory and visual stimuli. Graja, Lopes and Chanel (2020) studied the player. The psychological impact can be increased by the visual horror itself and the slow process of sound building up in the game. There is also research on the use of biofeedback to enhance the player experience in horror games. Dekker and Champion (2007) evaluated the analysis results to provide insight into how biometric analysis may influence and enhance current computer games. Research in Truter (2015) examining the link between the psychological increase associated with fearful emotions and the level of fear experienced by players playing horror games should provide insight into this deeper level of immersion. While scholarly research exploring aspects of horror games provides many valid and informative references, there is a relative lack of information on how different types of players experience satisfaction and discomfort in horror games.

This thesis uses the horror puzzle game model *Little Nightmare* to conduct an experimental study on the generation of different player types in horror games. The investigation studies the reactions and emotional experiences of two groups of different player types to fear to help game designers pay more attention to the emotional experiences and psychological feelings of more different types of players when developing horror games. The study can provide researchers with some player emotions influenced by the player's game history. It can allow game designers to pay more attention to the emotional experiences and psychological feelings of more different types of players when developing games.

2 Background

2.1 Horror films

Originating in France in 1895, the horror film is one of the many subjects of cinema produced for almost a century now. In its development, horror films have been fused with films that possess elements of thriller and disaster, and the components have developed into a unique genre of cinema (emotion of fear).

How films can generate strong emotional responses in viewers is a mystery to philosophers and psychologists working on emotional behaviour (Walters, 1989). Human beings have a long and deep memory of events they have personally experienced. When the people and events of a horror film have similarities to painful events that the viewer has personally experienced, the viewer will recall old tragedies due to the extreme realism of the film's portrayal (Li & Zhang, 2019). Li and Zhang (2019) argued that when viewers watch horror films, the various horror elements become a lingering nightmare in the viewer's mind. The reality of this nightmare has the direct effect of becoming an element of excitement, constantly stirring strong emotions in the viewer's mind. Hao (2006) analysed Freud's theory that dreams are often an unconcealed fulfilment of desires and that the episodes that appear in dreams are often what is in the mind. Like the way dreams are transformed, some of the horror elements in horror films come from the fears in the viewer's mind, and the viewers express the fears that arise in their minds when they watch horror films. Most horror films deal with the uncertain, unsettling, and frightening unknown, and they tend to trigger some kind of unnamed anxiety within humans (Stevens, 1997). Li and Zhang (2019) cited *Lift* as an example, where the director tells the whole story with the research of an alien organism extracted from a sample from Mars. As the creature slowly grows and attacks humans, the audience begins to share the fear of the film's protagonist and realises that everything will be destroyed if the exploration does not proceed. Many other horror films are similar to this, such as *A Quiet Place*, where the protagonist starts by running away. However, when his hometown is destroyed, he starts to escape and finds a way to solve the mutated creatures, and the fear he feels at this point is the fear of running away to survive. As both authors mention in their texts, the human desire to explore the unknown is one of the reasons for the constant fear.

When watching a horror film, the viewer's emotions react to the plot or characters. They may create sympathy, worry, fear, anxiety, and emotional empathy for the direction of the film's story and the fate of the characters. Some viewers have a sense of enjoyment for the horror plot. Since suspense is an integral part of horror, the hedonic properties of the audience change from harmful to enjoyable when they have strong fears and worries about the tense plot and storyline of the film (Zillmann, 1996). According to Carroll, "horror attracts because anomalies command attention and elicit curiosity" (Carroll, 2003). The setting of suspense, the ups and downs of the plot design and the sudden scares satisfy the psychological needs of the audience. According to American director Daniel Melick, horror appeals to human survival instincts; horror films challenge the psychological limits of humans in a safe environment, eliciting fear and excitement (Hao, 2006). This is part of the reason why some audiences enjoy watching horror films. Hoffner's (2009) study examined how empathy and responses to these types of content are related to the overall enjoyment, enduring negative affect, and exposure to frightening media. The authors conclude by describing that the fewer participants enjoyed seeing characters suffer, the more enduring. The authors conclude that the fewer participants enjoyed seeing characters suffer, the more enduring negative effect they experienced, but this

did not reduce their exposure to frightening fare. Higher for those who liked danger and disliked happy endings.

2.2 Horror games

Digital games have become one of the most popular forms of entertainment (Sherry et al., 2006). Although fear is usually considered an unpleasant emotion, it is sometimes used for entertainment purposes (Demarque & Lima, 2013). Computer games often draw on literary works, films and comics, but this is not a rule; sometimes, computer games inspire a film, a novel or a series of comics and other complementary content (Prohászková, 2012). As one of the genres of video games, horror games originated in the late 20th century. The main features of horror games are grotesque characters, chilling soundtracks, and frightening game plots. The main story is running away from an unfamiliar environment, either hiding from enemies or resisting in the face of a sudden enemy attack. In the history of video games, starting with the fusion of horror elements with adventure games in the early 1990s, there are now more and more styles and genres of horror games, with more and more horror elements being added to the enjoyment of the game. There are many types of horror in horror games, such as psychological fear, sudden scares, and survival.

Horror games utilize a role-playing framework that places the avatar –the player’s double—in a realistically uncanny environment, immersing players in a sense of adventure and curiosity to explore a third-dimensional virtual space (Carroll, 1990). In Prohászková's (2012) study, horror games were discussed in three groups, the first being games based on literary or cinematic artworks, such as *City of the Dead*: A game based on the motives of zombie-horrors by George A. Romero; *Evil Dead*: A series of games created based on the theme of Evil Dead films. *Blair Witch*: A trilogy of games based on a famous horror *The Blair Witch Project*. The second group of games served as a motif for films or tie-in novels, such as *Silent Hill*: A computer game inspired by the destiny of a real town in Pennsylvania (although the real name of the town is Centralia); *Resident Evil*: A game that unleashed the largest media franchise; *Blood Rayne*: A game about a vampire Rayne, who is trying to find her father et al. The third group includes games that have not yet spread from computer or console platforms to the cinema screen or print, such as *Clocktower*: A horror game based on solving various puzzles, while the player must hide and protect himself from enemy attacks as well; *Kuon*: A game based on old Japanese stories about ghosts called *kwaidan* and other games.

Horror games bring different feelings to many players. These games evoke emotions of fear, tension and disgust in the recipient (Prohászková, 2012). However, different scholars argue that horror games bring other different emotional states to the player. Perron (2012) argued that horror games put a novelty in the game, they can scare the player in different ways, and the effects brought about to confirm the fans' appreciation of the genre. Like audiences who enjoy watching horror films, fans of horror games enjoy being scared in horror games to satisfy their inner senses. Although the fear generated in the player's mind is uncomfortable, certain players derive satisfaction from horror. Ekaputri (2019) argued that horror video games draw inspiration from media such as literature and film and that players bring subjective emotions into the mix when playing horror games. Players take on different roles in different scenarios of horror games, experience different storylines and go through thrilling adventures that will be exciting survival stories with many exciting and dangerous tasks to complete.

2.2.1 Technical similarities and differences between horror games and horror films

Like the film, video games are a form of artistic expression derived from narrative and drama and a form of programmed media access (Frasca, 2003). There are many similarities and differences between horror games and horror films. Techniques to provoke fear in horror games have been developed over the years, some of which relate to visual aspects of the game environment, such as darkness, strangeness, and blurriness; others to the narrative itself, such as nightmares, isolation, paranoia; and others to the game audio such as suspenseful music, strange and frightening sound effects (Demarque & Lima, 2013).

Demarque and Lima (2013) discussed that most of these techniques were inspired by the methods used by cinematographers and film directors to create horror films. King and Krzywinska (2002) described horror games being highlighted as drawing on many features of horror films and their sub-genres. Kirkland (2009) explained that horror video game remediations—both diegetic and nondiegetic—serve the various narrative and ludological functions, providing atmosphere, context, and information, facilitating the scenario, aiding players' solution of puzzles and action sequences. The traditional function of remediation, highlighting the similarities between video games and film, enhances the cultural value of the form (Kirkland, 2009). For example, Poole (2000) noted an emphasis on “cinematic quality” in publicity for Konami's original *Silent Hill*, a practice that persists in subsequent advertisements' predominant use of noninteractive narrative-centred cut-scenes. According to the logic of remediation, the combination of horror video games on media texts and technology serves to enhance various realistic sensations, as well as to convey elements related to horror in general, and media montage used in recounting confessional accounts of the macabre (Kirkland, 2009) .

In horror games and movies, the setting plays a vital role and facilitates the continuation of the storyline to the viewer or player. Gloomy staircases, outdoor woods, domestic scenes, abandoned public settings, and every location or position can be a place of horror (Cui, 2019). Cui (2019) talks about how the scenes in *A Quiet Place* are mainly based around shelters and how the scenario configuration, although simple, plays a vital role in rendering the horror atmosphere, whether it is a dangerous basement or a horrific granary. In her research experiment, Graja, Lopes and Chanel (2020) implemented a total of seven scenes: radio news, heavy rain, radio warnings, a crying woman, a baby crying and going to the toilet, rain and a radio monologue, and an encounter with a monster, to design an experiment to understand the critical role that the choreography of audiovisual effects plays in shaping the atmosphere of fear in a horror game. Thus, both horror films and horror games need a scene to carry the story along.

A classic perceptual effect in horror games is to force the player to explore their surroundings in the dark and make it more frustrating than stressful, with the player never being in complete darkness (Graja, Lopes & Chanel, 2020). Graja, Lopes and Chanel (2020) stated *A flickering light* from a defective lamp or a dim light from a *flashlight* is always there to guide players but not to reassure them. Most horror games and films opt for very dark environments, where exploring the surroundings in the dark creates an instinctive sense of tension in the player or viewer. These effects create a hallucinatory atmosphere and limit the player's vision, making them feel less safe and succumb to imaginative fears of what might happen (Perron, 2004). This also keeps the player on their guard during the game.

Sound and sound effects are integral parts of horror films and games. Demarque and Lima (2013) mention that some horror games attempt to scare and intimidate the player by including the voices of ghosts of unknown origin, screams and whispers in the game audio. There are many psychologically stimulating sound effects in horror games, such as unstable doors, crying babies, shrill phone rings and monster screams, which can cause stress and tension in the player's psyche. Graja,Lopes&Chanel (2020) mentioned in audio design in horror media that one sound that is perhaps most worth investigating is the absence of sound. Silence is sometimes used in films to arrest the audience's attention in several shifting story directions. It may also give at some key point a feeling of emptiness that gradually grows into fear (Takemitsu et al,1995). *A Quiet Place* depicts a day-after-tomorrow future where humanity has been decimated by monsters able to snatch away any person who makes even the tiniest untoward noise (Krasinski,2018). In the horror film *A Quiet Place* (2018), the sound design is the most obvious as the story is set up so that the people in the film make a sound or cause any movement to draw out the monster. The monster is extremely sensitive to sound, so there is silence and no sound throughout the film. Sound effects only during moments of tension and excitement, which raises the audience's attention as there is no telling when the sound produced will draw the monster.

The viewer or player feels differently when watching a horror movie or a horror game. Video games are a remediation of films (Frasca,2003). Like horror movies, horror games capture the player's attention through a gruesome narrative. According to Ekaputri (2019), the build-up of suspense and tension in horror games comes from the way the enemies interact with the player. Horror games do not stop at the narrative but rather engage the player in the line of scary experiences (Perron,2012). As each player has a different subjective consciousness, different types of players will feel and experience different things as they explore different styles and scenarios of horror games. When they watch a film, the viewer has no control over any of the characters on the screen; they must follow the story's narrative (Lin, 2017). The suspense in a film that leads to a confrontation or resolution of a threat induces anxiety and fear (Tamborini,1991). In video games, players actively make decisions to engage with the storyline, leading to different outcomes and threat resolutions depending on the player's previous actions and decisions (Lin, 2013). As players play the game, they will have different outcomes for the game depending on their actions. For example, in the game *The Walking Dead* (2012), the dialogue options between the player and the non-player character are plot-influencing, and the player should choose their options carefully. Designers, sometimes, take advantage of these interactions to trigger "actions" that would lead players into an intended experience (Graja, Lopes & Chanel,2020)

2.3 The design aesthetic of horror games

Audiovisual aesthetics refers to the audiovisual design, including the spatial perspective, visual style and graphic materials used, and its sound design, music and voiceover (Thon, 2019).

In the scenario design of horror games, the environment creates a sense of psychological oppression for the player. Graja, Lopes and Chanel (2020) suggested that in *Silent Hill* (Konami 1999-2014), the environment is arranged so that the player is constantly on alert. In addition to the rust and blood dominated room design, the player is forced to explore the environment in the dark, carrying only a torch to illuminate their surroundings and using a radio to alert them to the arrival of monsters. This kind of arrhythmic environment sounds

resists listener adaptation, and the soundscape of the game requires constant attention, which is taxing to the player (Perron, 2014). Perron thought this type of low-level affective “trick” can be used to create an unconscious emotional effect that adds fear to the gameplay.

It is not just the realistic style that is included in the art design of horror games. In *Limbo*, the game features a minimalist black and white art style. The player controls the main character through a dark forest, avoiding traps and solving puzzles. The primary source of horror is the atmosphere, sound effects and graphics during the puzzle-solving process. The game is also a unique silent movie, presenting the player with a visually intense and well-lit black and white world.



Figure 1 Limbo's art style

For example, in *Little Nightmares* (2017), developed by Swedish game studio Tarsier Studios, the primary colours of the screen are characterised by low saturation and low brightness, with a very distinctive colour design style. The game designers have lowered the saturation of the scenes, and the colours are shown less vibrantly, with the main character Roku's yellow clothes becoming the most distinctive colour in the whole scene. The designers have amplified the contrast between light and dark in the game to emphasise the horror and dramatic atmosphere of the game. The images of monsters in horror games also tend to create a visual effect of fear in the player's psyche.



Figure 2 Little Nightmares' design style

Demarque and Lima (2013) wrote in an article on the Audiological perspective for horror games that they investigated the effects of auditory in this paper. They presented a case study analysing how the horror games *Silent Hill*, *Fatal Frame*, *F.E.A.R.* and *Hotel 626* use auditory hallucinations during the gameplay. They used a small-scale user study to verify the effectiveness of such auditory stimuli in provoking fear in players. The experiment results showed that auditory hallucinations are an essential element of horror games.

2.3.1 The psychology of fear

The designers of horror games exploit the psychology of fear as a feature by using the contrasting scenes of the game's graphics, the scary monsters and characters, and the insinuation of some symbols to elicit psychological cues that create fear from psychological sources as the player explores the game because of these features.

Little Nightmares is set in a childhood nightmare, where children are frightened of dark environments at a very young age and are sensitive to the slightest sound that appears in a silent and empty room. In his article on the aesthetics of narrative styling in digital games, Liu (2019) discussed the game *Little Nightmares* as depressing childhood nightmares as a backdrop, with solid stylistic contrasts to reflect the psychological cues the designer wants to convey to the player. The main character in the game is a little girl dressed in yellow. The image of the girl is a far cry from the monsters in the game, and the unique design of the monsters in the childhood nightmare reflects the designer's intention in the game, evoking the nightmare in the player's mind. The game designers also contrasted the image of the monsters with the look of the game's protagonist.

In the game, adults are portrayed as a group of man-eating monsters, their greed contrasting with their fragile appearance. The player has no attacking skills in the game and can only run and hide. This fear is reflected in the player's helpless flight and nervous dodging. The designers have designed some exciting parts of the game, such as avoiding the long-armed gatekeeper in the library and the terrifying monster chef in the kitchen. The local features of

these monsters are exaggerated. For example, the long-armed keeper is characterised by its long arms and sensitivity to sound. However, its eyes are invisible, and it is sensitive to the player's walk, using its long arms to grab the player based on the sound or movement of the player's walk.



Figure 3 Little Nightmares' monsters and characters

There are many childhood elements in the background of the game, but against a dark and dreary backdrop, these feel like a 'dark fairy tale', with features that suggest that the place you are experiencing is full of crises (Liu,2019). While there are no gore and thrills, some of the game mechanics, characterisation, setting design and voice acting are the main sources of fear, such as walking around in complete darkness, unaware of what lies ahead, or the background music and voice acting that come into play as the player progresses through the game. Although there are no frightening scenes throughout the story, everything that is presented together in the game's graphics will give the player great pressure to experience that terrifying force.

The first-person gothic walking-simulator *Layers of Fear*, which blends various horror game characteristics with typical Victorian Gothic elements and heavily focuses on story and exploration from the point of view of a psychic painter(Meye,Schweiger & Jesuitenhof,2018). Meye,Schweiger and Jesuitenhof(2018) discussed the goal of the game is to create a new magnum opus while exploring the dark past and happenings in the painter's familiar environment. The game designers have focused on conveying the emotional, psychological changes of the painter, portraying a painter's gradual descent into madness, and the painter's inner world is revealed, from anger to helplessness to helplessness and guilt. The scenes in the game change in line with the painter's mental world, a psychological fear that puts immense pressure on the player as they take control of the painter, as the player does not know what horrific change the painting on the wall will undergo in the next moment due to the painter's mental changes. Some of the background and ambient music in the game is also more interesting, with elements such as the sound of the wind, sounds from an old gramophone and piano sounds, and the fear seeps into the player's psyche in layers from these subtle details.



Figure 4 Layers of Fear's game screen

2.3.2 Fear of the unknown

The oldest and strongest emotion of mankind is fear, and the oldest and strongest kind of fear is fear of the unknown (Lovecraft,2016). The lack of information about the surrounding environment always gives humans a sense of insecurity, resulting in wariness and anxiety. For the emotional experience of horror films, the relationship between fear and anxiety is always mutually reinforcing and transformative (Li & Zhang, 2019). Li and Zhang(2019)argued that fear and anxiety are motivated by different factors in practical terms: fear is a sense of escape directly due to fear, with the result being retreat and flight; anxiety is a sense of tension due to the unknown, with the result being breakout and exploration. Liu (2019) understands the fear of the unknown as the unknowing of what is to come, such as an unexpected scene in life that suddenly happens. In some horror games, game designers design dark spaces where the player reacts with subconscious shock when encountering some scary elements, causing fear to spread from the heart.

Left 4 Dead 2 is a game where four players take on different roles. The primary source of fear in Survival is the zombies. In the horror environment, the player has to face many infected people and then escape to a safe house. However, before Jockey arrives, he emits an eerie laugh so that the player can immediately be on the alert and avoid being attacked by the special infected. The player is subconsciously terrified in the face of unknown fears. The witch is at its most deadly in the presence of the witch, which can knock the player down with a very high burst of power. When close to the witch, a harsh scream will be emitted, and the player will immediately be on alert if there is a witch ahead and will suffer severe damage and loss if the witch is disturbed.



Figure 5 Left 4 Dead 2's game screen

Team Silent developed *Silent Hill* (1999), and there are many profound metaphors in the game *Silent Hill*. The game's worldview is divided into a real world, a real place, a town shrouded in mist, and a virtual world, exploring the characters' inner world (Liu,2019). *Silent Hill* provides a prime example of this. It deliberately interferes with the player's performance by depriving them of seeing what is about to happen and removing their ability to read sound cues in real space (Krzywinska,2015). The player explores uncharted territory, not knowing exactly how many monsters are in the area or when fear will strike. The game scenes are all dim and eerie, and the player's only means of illumination is a torch; the human fear of darkness, of unknown territory, is almost subconscious, an instinctive human reaction. There are many doors in the room, and upon opening them, the player has no idea what terrifying monsters they see. Each of these monsters is given its meaning, a design that tells the player about the dark human psyche and how many terrifying monsters there are in this world, with no way of knowing when the next fear will come (Liu,2019). The prop carried by the protagonist will alert the player when a monster is approaching; it will emit an ear-piercing sound that will increase in volume as the monster approaches, which will add to the player's tension. Combined with the sound effects, the sound of water dripping in the silence, heavy footsteps, breathing, and unknown things hidden in the darkness, will create a feeling of tension and unease. Demarque and Lima (2013) mention that in the *Silent Hill* games, the game designers explore the players' fear of the unknown by scaring them with sounds, screams and growls that come from nowhere.



Figure 6 Silent Hill's game screen

2.4 Player emotions

The emotional experience of players is an integral part of game user research. With the growing popularity of digital games, many scholars have studied the emotional experiences of players in digital games. Game user experience specialises in measuring, analysing and understanding players' experiences and preferences (Depping, 2017). The quality of the experience describes the experience of the game. For example, during a game, players' emotions arise, and different types of players may have different emotions and feelings towards the game. According to Inal and Wake (2022), other aspects that contribute to a player's gaming experience are visual distractions, leaderboard manipulation, type of reward, game, gaming platform and player personality. For example, how players feel in a game may vary depending on the interface design and artwork, and players may feel uncomfortable with an element of the game. Poor visual design and aesthetic frustration in games can reduce users' perception of usability (Tractinsky, 2000). As a result, the feel of the game experience may be compromised. The factors that contribute to the player's gaming experience are also the player's own, and the experience gained from playing the game over time may also be affected. Inal and Wake (2022) explored how the presence or absence of a player's personal gaming history affects the gaming experience. Based on the findings, older players have a higher sense of positivity in gaming than newer players. In contrast, participants who had never played a game before used the most unfavourable and unfavourable experiences while playing. Therefore, it is concluded that there is evidence that a player's time spent playing, skills and familiarity with the game affect the player's gaming experience. In contrast, the absence of a personal gaming history affects the player's gaming experience.

There will be feelings of satisfaction and discomfort with the game as players play. Players may feel that horror games satisfy their own psychological needs. Some players may have negative feelings that horror games will lead to some unpleasant or uncomfortable experiences for themselves. The suspenseful settings, frightening plots and thought-provoking details of

imagery satisfy the mental needs of people. For players who enjoy horror games, a curiosity for the unknown horrors to come is created on a psychological level.

2.4.1 Potential satisfaction

The game designer's goal is to make the game enjoyable and satisfying for the player. The primary source of satisfaction for players is the setting up of plot suspense in horror games, where gruesome plots coupled with thought-worthy details are imagined to satisfy people's mental needs. For players who enjoy horror games, the curiosity about the unknown horror to come is created on a psychological level. Rickey (1982) posited that the successful resolution of a horror film is what makes it enjoyable. Horror films produce a plot reversal at the end, and most horror films present the audience with a lousy ending turned into a good one, meaning that the unpleasant psychology is removed. Like horror films, some plot endings in horror games provide a 'fix' for the player, who revels in the psychological transformation from bad to good. Players considered the experience rewarding because they could experience emotions they do generally not want to experience in real life in a safe environment (Endress, Mekler and Opwis, 2016). In horror games, players can experience exciting sensations that they would not experience in a calm life. Ntokos (2018) explored why people enjoyed horror games and argued that the first group of players enjoy being scared, just as people enjoy breath-taking extreme sports and activities; the second group of players mostly play horror games to show off or impress their friends of the opposite sex. Players like to be scared to experience the horror, and once it is over, there is a great sense of achievement and relief. Players can enjoy this horror because these anomalies in horror games capture their attention, and these horror games satisfy the player's curiosity.

2.4.2 Sources of discomfort

However, the study and exploration of player discomfort would also be exciting. They would provide game designers with another idea for improving games based on player discomfort, enrich the form of the experience and generate more reflections on game modifications. According to Gowler and Iacovides (2019) research, how player discomfort comes from uncertainty in high-pressure environments, where players develop anxiety and fear; when things do not go as planned, leading to frustration and feeling stupid; being offered a lot of responsibility but limited choices, where players develop anxiety and guilt, and the tragedy of losing in-game characters, leading to players being sad and helpless and not wanting to be exposed to disturbing themes, such as some gory images in horror games, which can cause players to become nauseous and retch. The process that players experience in horror games leads to solid adverse reactions, and players express emotions such as anxiety, sadness, helplessness and fear.

Gowler and Iacovides (2019) finding provide further evidence that negative emotions, or even predominantly negative emotions, can contribute to a richer gaming experience. In horror games, analysing how uncomfortable and fulfilling a player feels during a horror game can help improve the player's sense of adventure. If a player feels uncomfortable or has a low sense of achievement in a horror game, the player may develop a sense of disgust. Conversely, if the player achieves a high level of achievement in the game or if this game receives positive reviews from players, the player may feel that they have gained enjoyment from the horror game as a result. The player will gain a sense of satisfaction from the game even if they feel uncomfortable in the game. The player's discomfort and joy will also influence the player's gaming experience.

2.4.3 How the negativity of the player experience affects the player's perception of the experience

Endress, Mekler and Opwis (2016) described how participants coped with this horrible getting game experience after experiencing a horror game. After some form of discomfort, many participants were clear about the need to deal with their uncomfortable experience by pausing the game or taking a break. Most players would stop or remain after feeling discomfort to allow their mood to calm down. Along with the primitive physiological response, visual or auditory tension was generated when encountering scary images, with behaviours such as subconsciously running away or fighting back, moving away from the computer and dropping the headphones.

While the negative emotions generated by players can contribute to a rich gaming experience where players feel uncomfortable, players appreciate how games can use punishing difficulty or incorporate complex themes and decisions to provide them with more form of play (Gowler & Iacovides,2019). In most cases, however, players do not derive a more positive sense of experience from the discomfort; instead, they decisively abandon the genre after an uncomfortable experience.

3 Problem

Horror game research has long studied player Emotions. There have been several streams of research in this broad field of study. Some studies are about horror game satisfaction and uncomfortable experience feelings (e.g., Endress, Mekler & Opwis, 2016; Gowler & Iacovides, 2019). Other studies on different levels of horror in horror games (e.g., Ntokos 2018;), remedies for horror video games (e.g.,Kirkland 2009). Other studies are about how the aesthetic design in horror games causes different emotions in the players (e.g., Demarque & Lima 2013; Graja, Lopes & Chanel 2020), among others. These studies make essential and unique contributions to players' user experience in horror games. Endress, Mekler and Opwis (2016) studied what satisfaction players experience from scary game moments, but based only on the statements of players' experiences. Players may not have just one emotion of satisfaction in their experience.

It is also important to note that in the field of game user experience, the length of a player's personal gaming history, and experience, also affects how players experience a new game within the same game (Inal & Wake, 2022). However, the study by Inal and Wake (2022) is only about the mobile version of Super Mario, the types of games and platforms involved are limited, and there are many other types of players.

Based on the above studies, it can be found that there is no separate study about combining aesthetic design to analyze the game user experience of different player types in horror games. Therefore, it is essential to study the sense of the experience of different types of players in horror games and the players' emotions towards aesthetic design in horror games. The satisfaction of the horror game experience can be better understood. It may expand our conception of the player experience and, therefore, may help explain how the feelings experienced by different types of players in horror games differ.

This thesis has the following research questions.

How do different types of players experience satisfaction and discomfort in horror games?

Graja, Lopes and Chanel (2020) pointed out that visual, auditory and in-game interaction coordination plays a crucial role in shaping the horror atmosphere. Therefore, this study aims to take the basic design of horror games as a starting point and use the existing puzzle horror game *Little Nightmares* to determine the different player types that create horror games experimentally. Moreover, studying and investigating the reactions and emotional experiences of different player types to fear will help game designers pay more attention to the emotional experiences and psychological feelings of more different types of players when developing horror games. What elements in horror games do players react to? How do players experience satisfaction and discomfort in horror games? How does the length of the player's experience in a horror game affect the player's sense of the game experience?

My contribution to knowledge is a detailed analysis of the aesthetic design of some horror games. Furthermore, experiments to obtain data to help some horror game designers focus on the discomfort and psychological feelings of different types of players when developing horror games to help improve the experience.

4 Method

4.1 Overall research process

The overall research process of this paper is from experimental design to empirical evaluation.

The case study approach was used to analyze horror games from two different sources of horror perception. In the background, the aesthetic design of horror games was analyzed. Demarque and Lima (2013) conducted a case study to verify the audiovisual effects in the game, analyzing how four horror games use visual and auditory design during gameplay. The case study method was used to obtain data from an existing completed survival horror game and analyze the results. The theories mentioned in the background were combined with the sources of horror in *A Little Nightmare* to form a sense of the player's game experience. Comments on the aesthetic design of the horror game were also studied in the experiment. Endress, Mekler and Opwis (2016) collected statements about the emotions experienced by the participants in the experiment and grouped them into different categories based on what was studied. Some players may feel comfortable and excited during the experience of a horror game, while others may feel more uncomfortable during the game. This research method aims to study the different psychological feelings that players with different horror game experiences get from horror games.

4.2 Game description

In this section, I explained which parts of the game were designed to be used for playtesting sessions and choose the game's plot as the selected event, where I recorded the player's heart rate changes as critical events occur.

Little Nightmares is a horror/thriller adventure game where the player plays as a little girl in a yellow raincoat trying to escape "The Maw", "Upon escaping "The Maw", the player will be faced with many horrors and surreal encounters (Powers, 2022). Because the game's test time is a concise twenty minutes, the player will be assigned a fixed chapter, the second subsection of *Little Nightmares* chapter one.

This is because the second subsection of this section is the initial level. Many participants had little experience with horror games (Appendix E), so the section chosen was relatively simple. Second, this section contains the psychology of fear, fear of the unknown, and aesthetic design in horror games. There are also many exciting event points in this section that can be used as data for research.

The monster of this chapter is a librarian with long arms. The little girl named Six is tempted by food during her escape and is captured by the librarian. After escaping, she will avoid the librarian. At the end of the chapter, the player will use the door to cut off his hand and enter the next chapter. In the chapters of this test, players will experience events such as being suddenly put into a cage, being chased by a long-armed keeper, and escaping on a bookshelf. These events experienced by each player will be recorded in a table (Appendix B).



Figure 7 Little Nightmare game description

4.3 Experimental process

4.3.1 Planning and preparation

After identifying the post-study questions, we chose an existing game model as the game for the experiment, which was named "*Little Nightmare*". The methods used in this study included qualitative research, quantitative research, and biometric measures. Quantitative researchers allow researchers to use experimental methods and quantitative measures to test generalizations of hypotheses. Because of the research questions, some feedback data was collected and provided by the players based on the games in the experiment. The data were then parameterized using software such as SPSS and Excel to see how similar these data were or the accuracy of the findings in the quantitative research methods. In qualitative studies, demographic interviews, semi-structured interviews and audio recordings make the constructs more valid, reliable and diverse. In Truter's (2015) study, both quantitative and qualitative methods were used, and biometric tracking of participants' heart rates to collect quantitative data from participants, which the authors concluded could indicate if there were changes in participants' physical state and may indicate that immersion in a horror game environment may induce fear.

Interviews are a primary method for researchers to understand the inner world of players and continue to play an essential role in understanding player behaviour and motivation because they provide direct insight into players' perceptions of how the game works. Questions about players' satisfaction and discomfort in horror games have been studied primarily through interviews. Interviews are an essential part of a successful qualitative user testing session. Endress, Mekler and Opwis (2016) used semi-structured interviews in their experiment in order to determine what kind of horror game experience players prefer. The use of semi-structured interviews allowed for a greater variety and validity of the textual returns obtained to determine the satisfaction experienced by the players from the horror moments of the game. In analyzing the results, feedback was explored based on the obtained player interviews and comments and how the aesthetic design in horror games affects the player's gaming experience.

Additional information was requested in the interviews, and participants were guided to answer questions to obtain questions for the study. For user testing of horror games, player reactions and heart rate changes are essential, as players physiologically react to feelings of fear after they arise. Their emotional differences and reactions can be shown by their responses. The physical measurement of choice is a heart rate testing apparatus, which records the heart rate changes of the tester during the experiment. Although some of the players' actions and facial expressions can positively reflect the differences in emotional characteristics in the horror game, some players' expressions are not apparent to avoid influencing the study results. Therefore, using biometric methods, information on players' mood fluctuations can be collected without disturbing their games. Although collecting data may give a false signal and there is no clear way to understand their meaning, data from biometrics and other methods (observation, interview, questionnaire) can compensate for this false signal. During the study, I designed a record of player performance at event points (Appendix B) and a heart rate recording form (Appendix B). Graja, Lopes and Chanel (2020) used The game's logging system in their study. The logging system was set to keep track of the instant an event occurred during the game. The moment an event takes place, a timestamp and an identifier along with the event. The logging system was set to keep track of the instant an event occurs during the game, and the moment an event takes place, a timestamp and an identifier along with the event's name is attached to a logging string. Using the table to record the player's reactions makes it easier to summarize the data regarding statistics.

4.3.2 Data Collection

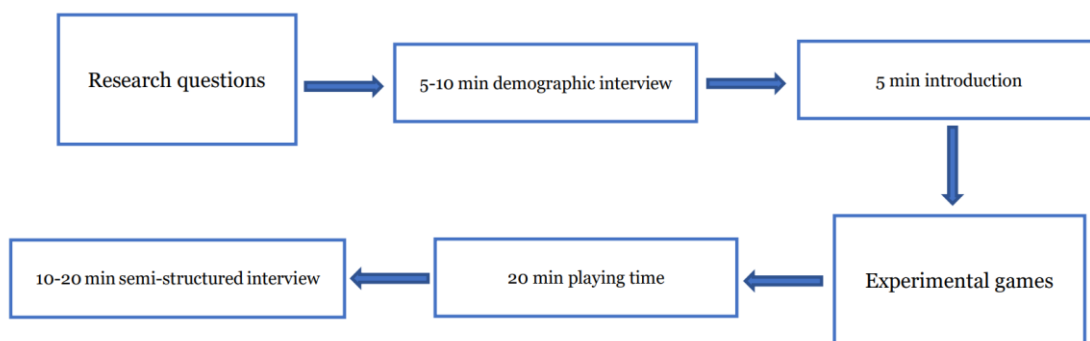


Figure 8 Experimental flow chart

Before players start playing the test game, a short interview of 5 to 10 minutes.

For RQ1, the interview results will be used as the primary method to answer the research questions to obtain more detailed feedback from the players. The discussion mainly obtains data on the players' experience of the horror game before the game and the changes in mood, comfort and satisfaction after the game.

Before the playtest, I will conduct a short interview with the players for about five to ten minutes (see Appendix A). The main question of the interview is, *have you been exposed to horror games before? If so, how much experience do you think you have? (1 - Never played a horror game before 7 - I am a big fan of horror games)*. All participants were asked

questions about their previous experiences and subjective preferences (Dekker & Champion, 2007). This will be used as an essential basis for subsequent grouping of test players based on their gaming experience. After a short interview, players are given a brief overview of the game model, the background of the game, and the basic button presses.

By using a heart rate device, the initial heart rate is recorded. The video recording device is turned on, and the player starts the game while the heart rate starts to be recorded. The player's level of reaction to the game is recorded at the point in time when the horror element appears. The player's heart rate will be recorded at the end of the game test. Testers will participate in a separate interview at the end of the test, which will last 15 to 20 minutes and focus on talking about their evaluation of the game and their feelings of satisfaction and discomfort.

4.4 Equipment

In this study, the required equipment was prepared in advance: a computer, mouse, keyboard and headset were provided by the researchers.

Computer recording: the software ApowerREC was used to record the players' gameplay.

Heart rate testing apparatus. A sports watch, model HONOR Band 5-64A can measure the participant's pulse. Nowadays, through many heart rate apps, smart watches and sports monitoring devices. HR monitoring has been used to assess the response to different sports stressors (Achten & Jeukendrup, 2003). Heart rate tests are relatively easy for novice game user studies to use in biometrics.

4.5 Data analysis

At the end of the experiment, relevant data were collected, summarized, and aggregated, and I used triangulation to analyze and draw conclusions. Patton (2001) advocates triangulation by stating, "triangulation strengthens a study by combining methods, using several kinds of methods or data, including quantitative and qualitative approaches. In triangulation, several different elements of the horror game test are combined in data analysis. For example, the metrics analyzed in this study are heart rate, satisfaction, comfort, the mood before and after the test, comments from some players, and players' experiences with horror games, combining these aspects to analyze how players gain satisfaction and discomfort in horror games.

Analysis 1: Participants were divided into two groups based on the ratings of the player experience, and I compared the comfort, satisfaction, and mood indices of the two groups before and after the test. After the experiment was completed, data from each participant was aggregated, and I summarized the data from the survey. Non-parametric tests are used to analyze players' experience, while parametric tests are chosen for players' comfort, satisfaction, and mood indices before and after the test.

Analysis 2: For the analysis of players' horror game experience on players' comfort, satisfaction and pre-and post-test mood values. The chi-square test of the non-parametric test was chosen to examine the degree of deviation of the observed values from the theoretical values and to investigate whether the amount of players' horror game experience affects the above aspects.

Analysis 3: Based on the feedback and evaluation obtained from the interviews, combined with the psychological and fear of the unknown mentioned in the research context. This study analyzed the influence of aesthetic design or in-game factors (monster image, character image, sound, environment, camera.) in horror games on players' game experience.

4.5.1 Interview questions

In order to better obtain data and feedback, interviews will be used as the primary research method for this question. Qualitative data will be collected in interviews with participants before and after the experiment, and participants may exhibit behavioural changes (Truter, 2015).

Interview 1 was a demographic interview consisting of eight questions focused on understanding how players felt prior to the experiment (see Appendix A)

Interview 2 was a semi-structured interview consisting of 12 questions in which the players were individually instructed, and the following questions were discussed (see Appendix A). The primary purpose of both interviews was to understand the participants' basic knowledge of other horror games and their thoughts, reactions, emotional changes, comfort, and satisfaction after playing the experimental game "*Little Nightmares*". The main content of the interviews was to find out why players felt uncomfortable after playing the game and whether there were elements in the game that participants liked or disliked. The second was to get more feedback to help analyze how the aesthetic design of horror games affects the player's experience and how the fear of the unknown and the fear of fear affects the player's experience.

4.6 Participants

A total of 15 individuals were recruited for this experiment. Eight of them were male, and seven were female. Their ages ranged from 19 to 28 years old. All participants volunteered for the test, were informed of the type of game before being tested to see if they were comfortable with the horror game, and were told they could withdraw from the testing session if they felt particularly uncomfortable. They agreed to the authors' consent form (Appendix C).

All participants played digital games for more than ten years, and they played games at an average frequency of three to five times per week, 1-3 hours per day, and 20 hours per week.

The majority of the 15 testers played games using devices such as PC, Nintendo Switch, and cell phones.

The survey revealed that their preferred game genres were RPG, open world, card games, music games, RTS, racing, FPS, MOBA, tower defence strategy, and other genres.

None of the recruited testers primarily liked the horror game genre.

Experience with horror games was rated on a Likert scale of 1 to 7. In Hoffner's (2009) study, assessment data using a 7-point Likert scale to measure users' Empathic concern and Personal distress were used to detect Empathy and Enjoyment of Different Types of Scary Content. The choice of scale assessment allows for easy design and calculation of data. Nine participants were categorized as having low experience with scary games in the total sample, while the other six were categorized as having high experience with scary games.

4.7 Ethical considerations

The study complies with the regulations of the Swedish Research Council (2021) and will not cause harm to the participants. These data will not involve the participants' privacy and will only be used for data analysis regarding the experimental data. Participants will appear in the text with the numeric code "Tester" to protect their identity. Before the first interview, all participants will be provided with a consent document (Appendix C). All participants will be informed of the content and purpose of their participation and the purpose of obtaining data. All participants will participate in the experiment voluntarily and have the right to terminate and withdraw immediately if they feel uncomfortable. Videos and images taken during the experiment will be stored locally, and only the authors will be able to see them. All videos and images will be deleted at the end of the study.

5 Analysis

Analysis 1: Analysis of the distribution of experience values between participants with low experience values (LoExpgroup) and participants with high experience values (HiExpgroup); comparison of comfort, satisfaction and pre-and post-game moods of LoExpgroup and HiExpgroup.

Analysis 2: Whether participants' experience values have an effect on the aspects of comfort, satisfaction and comparison of mood before and after the game for LoExpgroup and HiExpgroup.

Analysis 3: Which elements of the horror game do participants react to the presence?

5.1 Player experience

The majority of LoExpgroup participants' experience was spread over a score of 2 (see figure 9), with an average frequency distribution with a mean of 2.00, a minimum of 1 and a maximum of 3. Although many participants had little exposure to horror games, those who had not played them at all were still in the minority.

The distribution of participants' experience in HiExpgroup was on a scale of 4 and 6, with a mean of 5.00, a minimum of 4 and a maximum of 6. Half of the participants had experience with horror games 6. Participants in this group had some knowledge of most horror games, had tried other types of horror games, and had some experience with horror games but did not appear to be big fans of horror games participants (see figure 9).

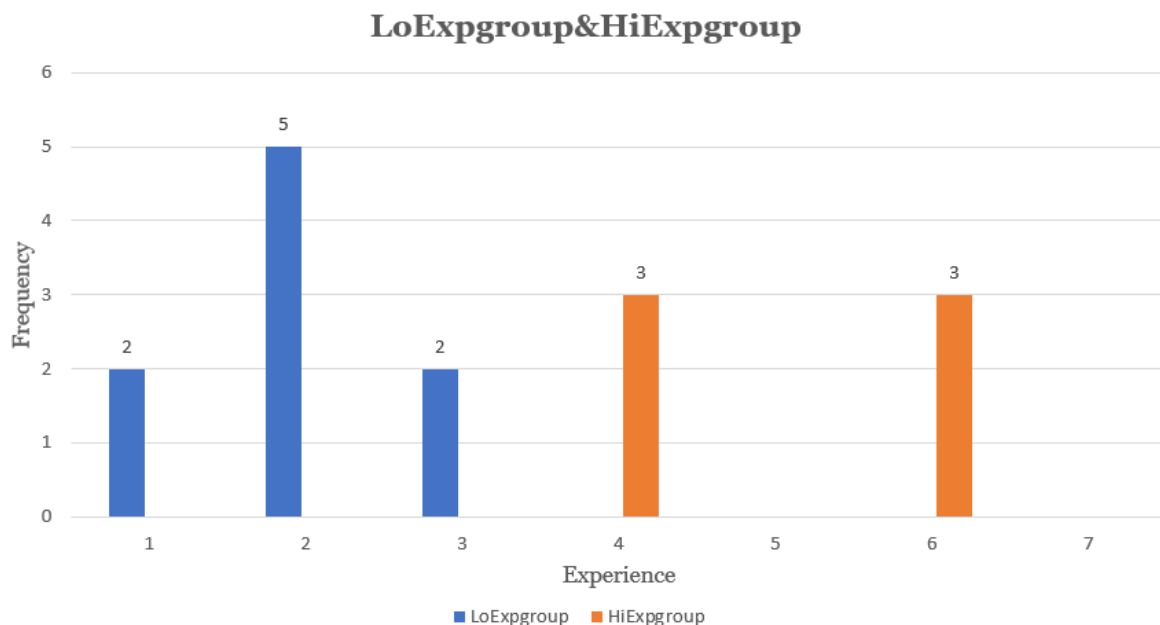


Figure 9 LoExpgroup&HiExpgroup player experience

The variance of participant experience in LoExpgroup was 0.5, and in HiExpgroup, the variance was 1.2. Thus, the distribution of participant experience in LoExpgroup is very concentrated, with slight fluctuation in the individual data. The individual participants in HiExpgroup have a greater degree of dispersion in the data, with a smaller proportion of players being very fond of horror games.

5.2 The impact of game experience

The primary method of data analysis in this section was the chi-square test, where the participants' game experience was considered the independent variable and the participants' comfort, satisfaction, and mood scores were the dependent variables. The data was used to test whether there was a relationship between the game experience and participants' comfort, satisfaction, and mood and to demonstrate whether there were significant differences in the results.

Participants' game experience significantly affected their comfort level in the game experience. Participants who had less experience with horror games reported feeling more uncomfortable while playing the game than participants with more experience. This difference was statistically significant. [$\chi^2 (1, N = 15) = 3.615, p < .05$]

There was no significant difference between participants with less experience with horror games and those with more experience in terms of reported feeling of satisfaction from horror game [$\chi^2 (1, N = 15) = 1.253, p > .05$]

There was a significant effect on the mood index of playing the game between participants with less experience with horror games and those with more experience. This difference was statistically significant. [$\chi^2 (1, N = 15) = 5.003, p < .05$]

To conclude, the scores on the comfort level and mood index that participants gained from the gaming experience were significantly influenced by the participants' gaming experience.

5.3 Player comfort from the game

Overall, LoExpgroup participants had a low comfort level after playtesting. HiExpgroup participants had a high comfort level after playtesting.

The average post-game comfort level of players in LoExpgroup was 3.33, with a minimum value of 2 and a maximum of 6.

The majority of the participants chose a score of 4, with a range concentrated between 2 and 4, and two individuals chose a high score of 6 (see figure 10). Based on the results of the interviews, the reasons investigated were that Tester6 did feel comfortable in the game and enjoyed it. Tester4 thought that the sense of atmosphere and level design in the game appealed to him. The rest of the participants felt uncomfortable primarily because of the dark environment in *Little Nightmares*, which caused discomfort, feeling scared and fearful, and constantly failing and having a sense of frustration. It can be seen that the overall comfort level of the players in LoExpgroup from *Little Nightmares* was low.

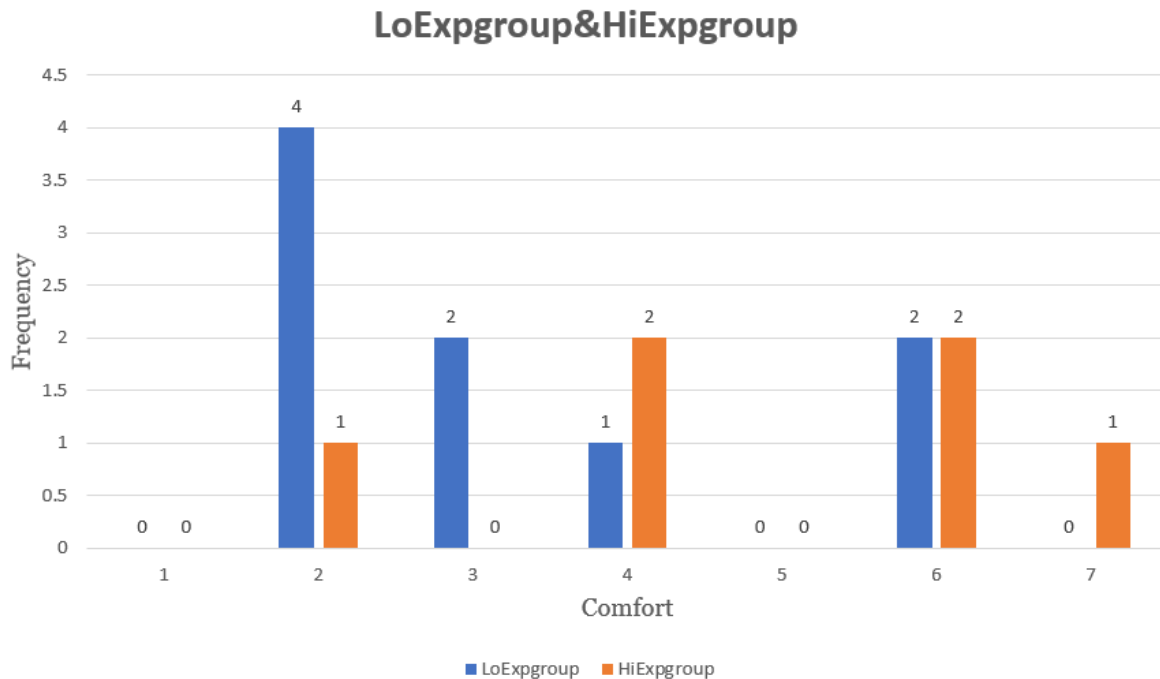


Figure 10 LoExpgroup&HiExpgroup comfortable from the game

In terms of the comfort level felt in the game in HiExpgroup, the mean comfort level participants obtained from *Little Nightmares* was 4.83, with a significant difference between the maximum and minimum values and a variance figure of 3.367, with a relatively large variation in scores per participant and scattered data.

In the group with higher experience in the game, participants had both high and low comfort levels (see figure 10). Most chose intermediate values, and half of the highly experienced participants felt more comfortable with the horror game. In the Hiexpgroup, only one participant scored very low. This was because he felt uncomfortable with the darker elements of the environment. It can be seen that the participants in the HiExpgroup were most comfortable with the mechanics and atmosphere of the horror game and did not feel too uncomfortable.

The mean value of the comfort level of participants with low horror game experience, represented by LoExpgroup, was 3.33, while the mean value of the comfort level of participants with high horror game experience, described by HiExpgroup, was 4.83. Overall, participants in LoExpgroup obtained a lower level of comfort after testing than HiExpgroup.

The reasons affecting the difference in comfort level between LoExpgroup and HiExpgroup participants were the players' personal experience and some aesthetic design in the test game. Participants in LoExpgroup felt that some elements of the game, the dark environment, music, sound effects and monster images, exploring strange things in a dark environment made them feel uncomfortable. A small number of participants in LoExpgroup felt that their experience in the game was too low, that they did not have the skills to get through the game and that they often failed in the process, thus leading to a sense of frustration. One player described it as "*a natural feeling of fear when exploring a dark space with obstructed vision, filled with monsters of all sorts of strange proportions and huge monsters that make you feel uncomfortable.*" In HiExpgroup, some participants felt a sense of achievement for having

successfully solved the puzzle and passed the level. Some felt scared, but the majority thought that they had gained a sense of accomplishment after having successfully passed the story, and many HiExpgroup participants were so comfortable with the dark environment that they did not feel scared or intimidated by the horror element. One player noted, "*I love this game. There are elements of gameplay in it that I love, and I love the thrill of exploring and playing in this dark environment.*"

5.4 Player satisfaction from the game

In terms of the satisfaction gained from the games in LoExpgroup, the mean satisfaction gained by participants from *Little Nightmares* was 4, with a minimum value of 1 and a maximum value of 7. The variance fluctuated more, the scores varied more, and the data dispersed (see figure 11).

Almost every score in the range from 1-7 was selected by participants, suggesting that LoExpgroup participants' views on gaining satisfaction from the game varied from person to person. Based on the details obtained from the interviews, it can be understood that participants with higher scores felt that although it was easier to feel scared and felt the pressure by the horror during the game, there was a sense of excitement and the joy of solving the puzzle successfully, and a sense of achievement; participants with scores in the middle range felt that they would get satisfaction from finally passing the game after dying several times and experiencing the full plot. Finally, players with low scores, who felt that they could not release themselves from the horror game and could not feel a sense of relaxation.

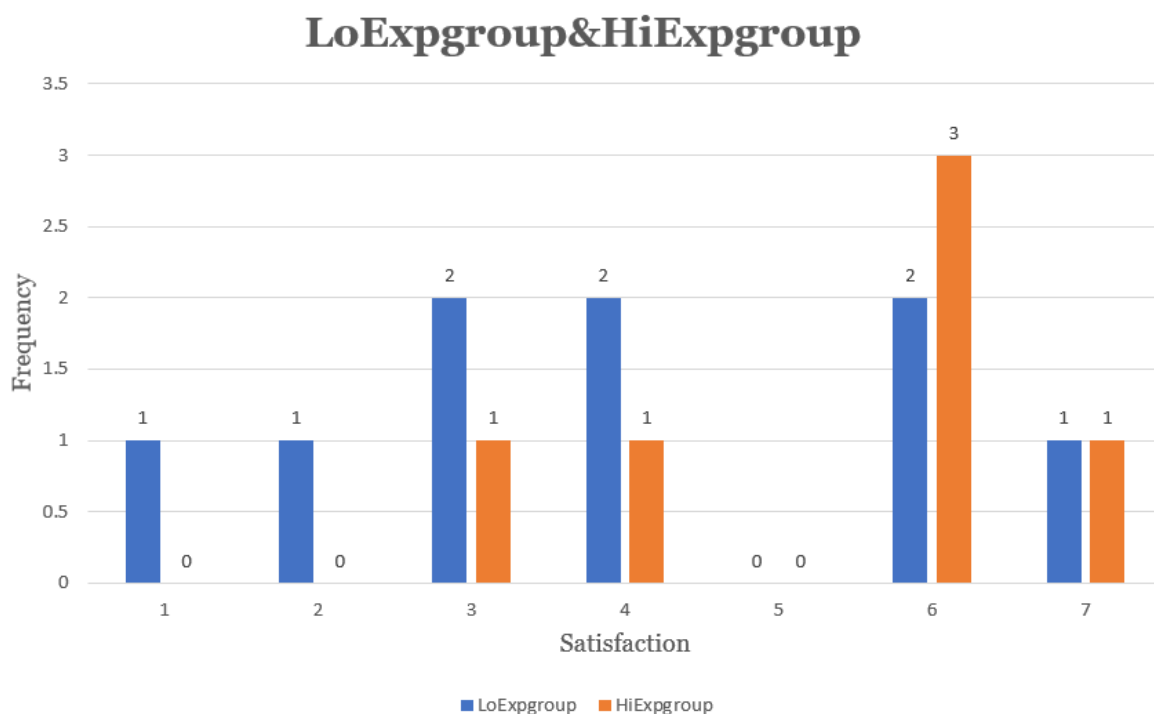


Figure 11 LoExpgroup&HiExpgroup satisfaction from the game

Looking at the satisfaction obtained from the games at HiExpgroup, the average satisfaction of the participants was 5.33, with a maximum value of 7 and a minimum value of 3. The variance data was 2.267, and the data was somewhat scattered.

In HiExpgroup, more than half of the participants received high satisfaction from the horror game (see Figure 11). A small number of players were not very satisfied. To understand why participants did not receive high levels of satisfaction from *Little Nightmares*, after detailed interviews, I found that it was because of the number and length of horror games played by one of the testers. He found *Little Nightmares* easy to play and passed it without a care in the world, hence the low level of satisfaction from *Little Nightmares*.

The mean satisfaction value for participants with low horror game experience, represented by LoExpgroup, was 4, while the mean satisfaction value for participants with high horror game experience, represented by HiExpgroup, was 5.33. Overall, participants in HiExpgroup received higher satisfaction after the test than participants in LoExpgroup. Some participants with low horror game experience gained a sense of accomplishment by finally passing the game after multiple failures. For example, *"After going through the game for twenty minutes, there is a certain sense of accomplishment from playing it. It requires one to work hard to try to escape the creepy and scary ship, and there is a sense of accomplishment from passing each level."* HiExpgroup participants had a high level of comfort after playtesting because they had a high level of experience with horror games and were able to pass levels quickly and successfully experience the plot and gameplay. For example, *"The game felt simple and was easy to pass."*

5.5 Player mood from the game

The pre-test mood index of participants in LoExpgroup had a mean value of 5.89, a minimum value of 4 and a maximum value of 7, mainly concentrated between the 4-7 interval, with slight variance and less fluctuation in data aggregation (see figure 12). Comparing the post-test mood indices of LoExpgroup participants, the mean value was 3.67, the maximum value was 6, and the minimum value was 2. The variance was more significant, and the data fluctuated wildly, indicating that the mood of LoExpgroup participants fluctuated more after the game test, and the contrast was evident between those whose mood indices increased and those whose mood indices decreased. For example, *"It is too hard, I do not know how to play."* *"Do not like the game design of being chased."* *"I feel nervous and panic when the monsters chase me."*

The pre-test mood index of LoExpgroup participants was distributed between the interval 4-7 and after the playtest, the participants' mood index was distributed between the breaks 2-6 (see figure 12). Overall, participants' mood scores decreased after the playtest. According to the detailed data, the two participants' mood indexes remained the same, while the rest of the participants' mood indexes tended to decrease. This suggests that participants with less experience of in horror games may have caused participants to become in a bad mood after playing the game. Based on the feedback obtained from the interviews, it is possible to understand the players' moods as angry, nervous, feeling overwhelmed and scared.

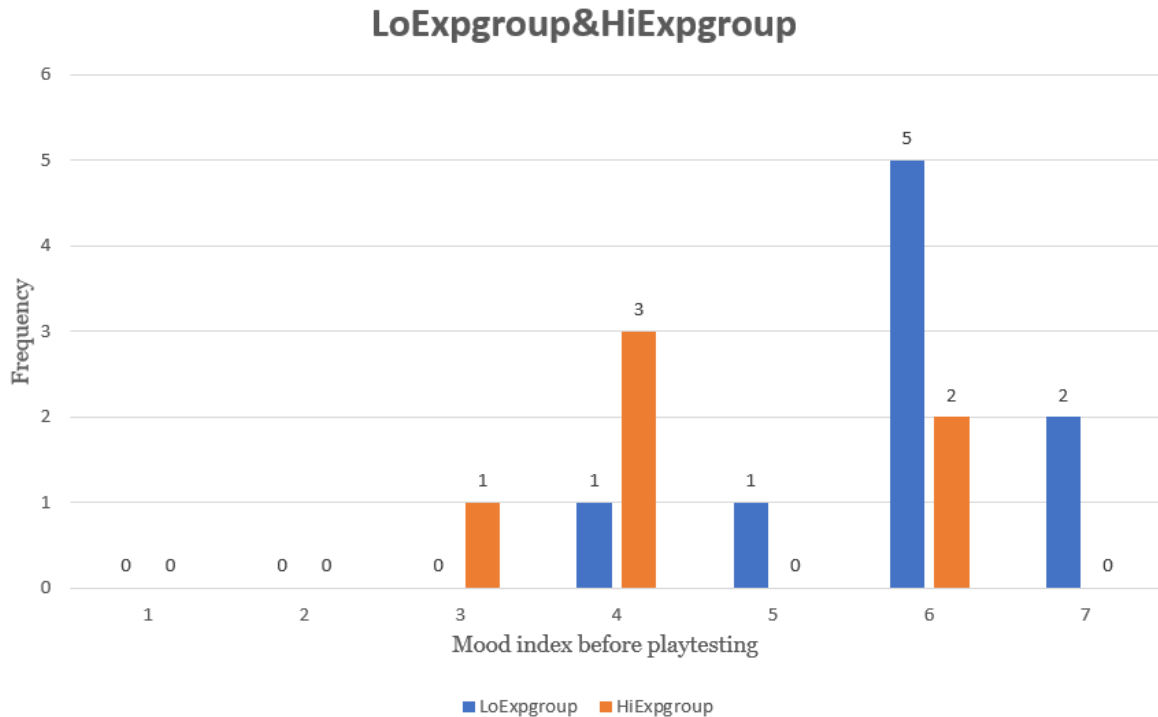


Figure 12 LoExpgroup&HiExpgroup Mood index before playtesting

The pre-test mood index of participants in HiExpgroup had a mean value of 4.50, a minimum value of 3 and a maximum value of 6, mainly in the range of 3-6 (see figure 13). In contrast, the post-test mood index of HiExpgroup participants had a mean value of 5.83, a maximum weight of 7 and a minimum value of 4. Overall, the overall mood index of HiExpgroup participants tended to increase after the test.

The pre-test mood index of HiExpgroup participants was distributed between the 3-6 range and after the playtest, the participants' mood index was broadcast between 4-7 (see figure 13). According to the interviews, *"I could feel some sense of horrible oppression in the game, and after I dodged the monster, I felt that I succeeded, and I found the gameplay interesting."* Some participants' moods did not change. For example, *"The game scenes are not scary. There is no sense of experience."* *"It is not very scary."* Overall, the participants' mood indices increased after the playtest. There were two participants whose mood indices did not change before and after the test, while the remaining three testers all experienced an increase in mood. Based on the interviews, it can be understood that most of the HiExpgroup participants were in a happy and excited mood after the game. They felt comfortable and excited because they gained satisfaction and excitement from playing *Little Nightmares*, experienced the entire plot, and found the game interesting. The upward trend in the mood index of more than half of the testers suggests that the amount of horror game experience may have been a factor in participants' mood index change.

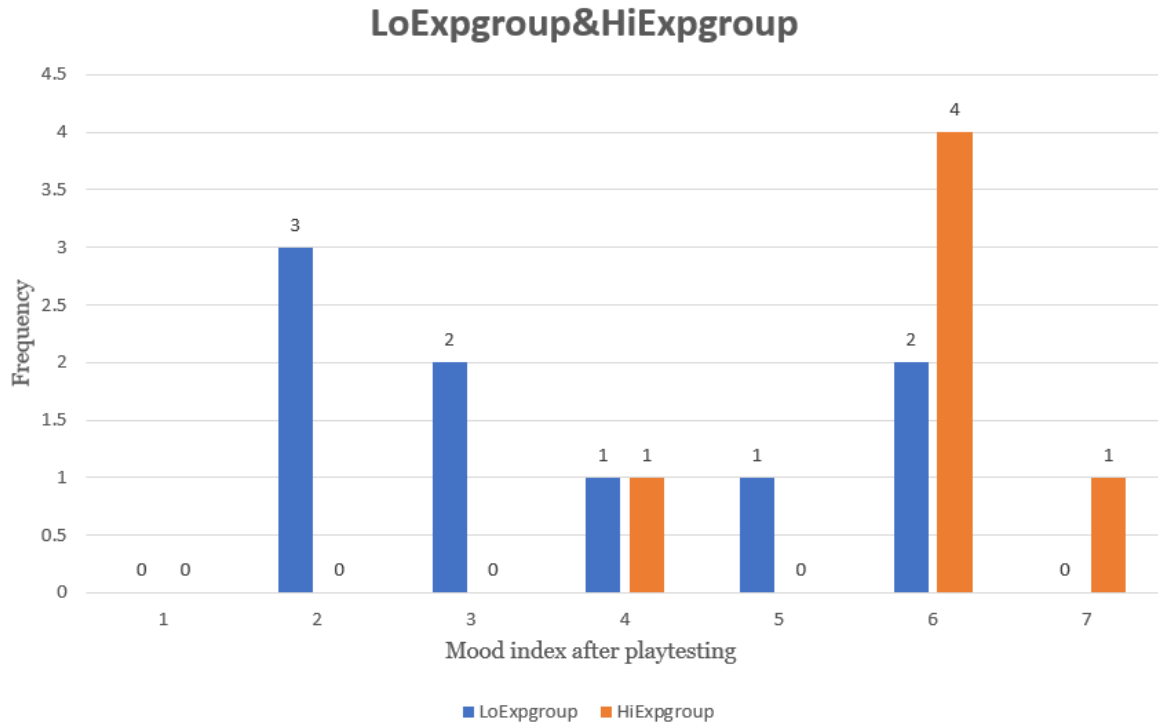


Figure 13 HiExpgroup&HiExpgroup Mood index before playtesting

Overall (see figure 14), the mood index of the participants with low horror experience, represented by LoExpgroup, tended to decrease, with the mood index of the participants reducing significantly after the game, which made them feel uncomfortable and affected their mood during the game experiment. On the other hand, the participants with high horror experiences, represented by HiExpgroup, showed an upward trend in their mood scores. It is clear that the mood scores of this group increased after the game test and that their moods improved after the game test horror experience.

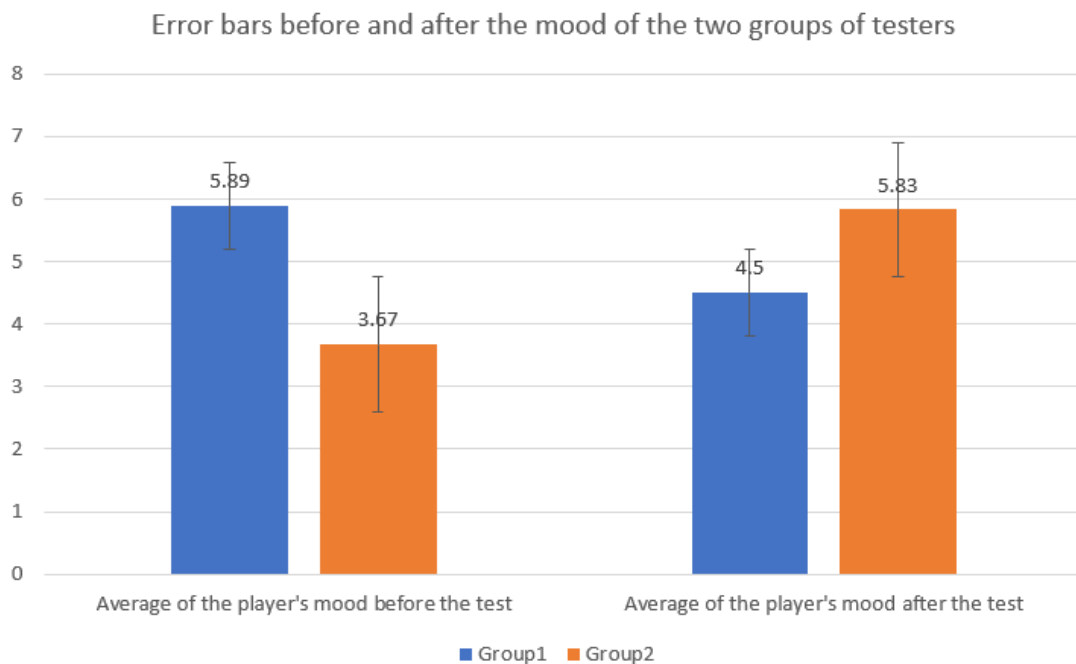


Figure 14 LoExpgroup & HiExpgroup Mood index

5.6 The psychology of fear and fear of unknown

Two types of fears were included in *Little Nightmares*, the psychology of fear and fear of unknown, where participants were unaware of things that appeared in the dark space or elements of the game that would cause fearful mental cues to the player. When measuring the participants' experience of the game, I did list the occurrences of these elements as events and arranged them in the order in which they occurred, and recorded the player's heart rate as these events occurred.

Figure 15 shows tester 1's heart rate at specific events in the game (presented in Appendix B); the events in the horizontal coordinates are some relevant and essential plot points. The other ordinary numbers are recorded during the game, such as the player entering a dark space, flipping a switch and other regular events. The vertical coordinates are the values of heart rate changes. By looking at the table of the player's heart rate change, it can be seen that the player's heart rate will change at the critical event points in the game in an upward direction.

Using tester 1 as an example, tester 1's heart rate rises when reaching key events, reaching a peak at event three and event 4, a time when I observed the player in a highly stressed state. For events 3 and 4, the moment when the player escapes the long-armed keeper and one of the key parts of this test chapter.

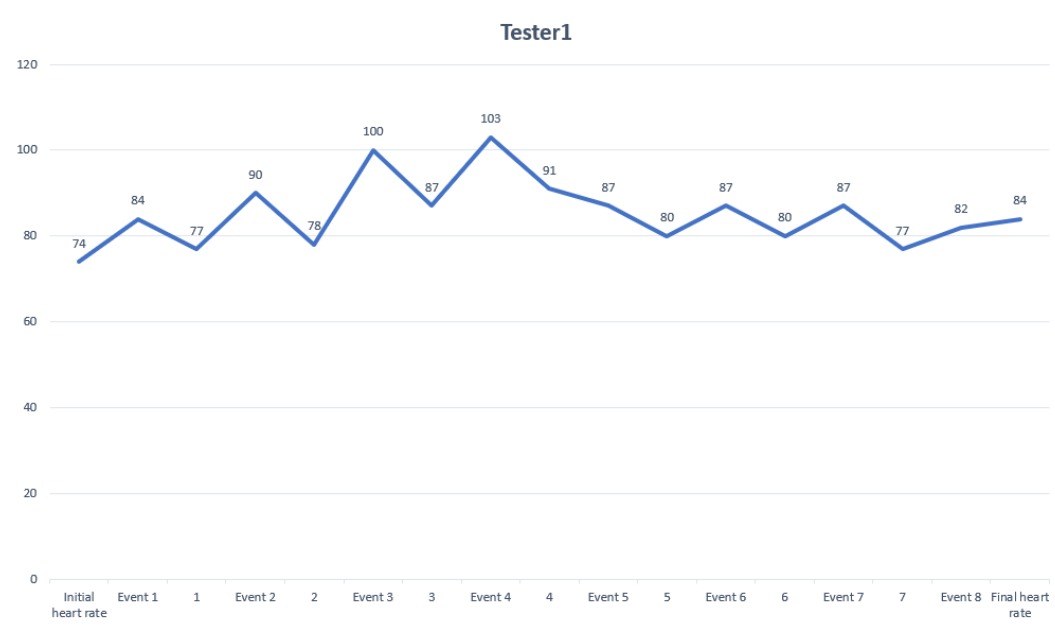


Figure 15 Tester1 heart rate

Some players also have heart rate fluctuates more, with significant changes only occurring when essential horror elements are present (see figure 16). For example, for tester 3, I observed that the tester's heart rate would drop during some walking or thinking about solving a puzzle. When faced with a sudden fright or when avoiding a monster, not being able to attack the monster, only being able to run away quickly in case of danger, and also needing to find objects to escape from a situation, such as a key dropped on the ground, turning on a switch for electricity. Immediate reaction and quick action are therefore required, and in the face of

fearful oppression there is also a reaction to be made, the player will have a nervous reaction and the value of the heart rate will rise.

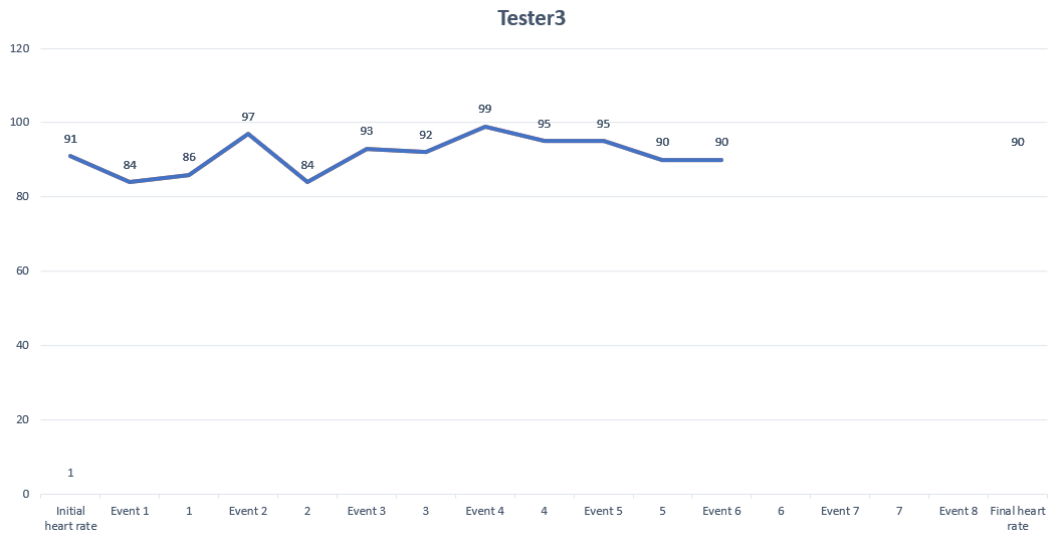


Figure 16 Tester3 heart rate

Figure 17 summarises some of the general results of the difference in heart rate between the two groups of player events. It can be seen that the players in LoExpgroup had generally higher heart rates per time point than the players in HiExpgroup. This is because some of the players in HiExpgroup have experienced more horror games and have more gaming experience, so they may feel less nervous mentally when faced with some of the elements in the horror games.

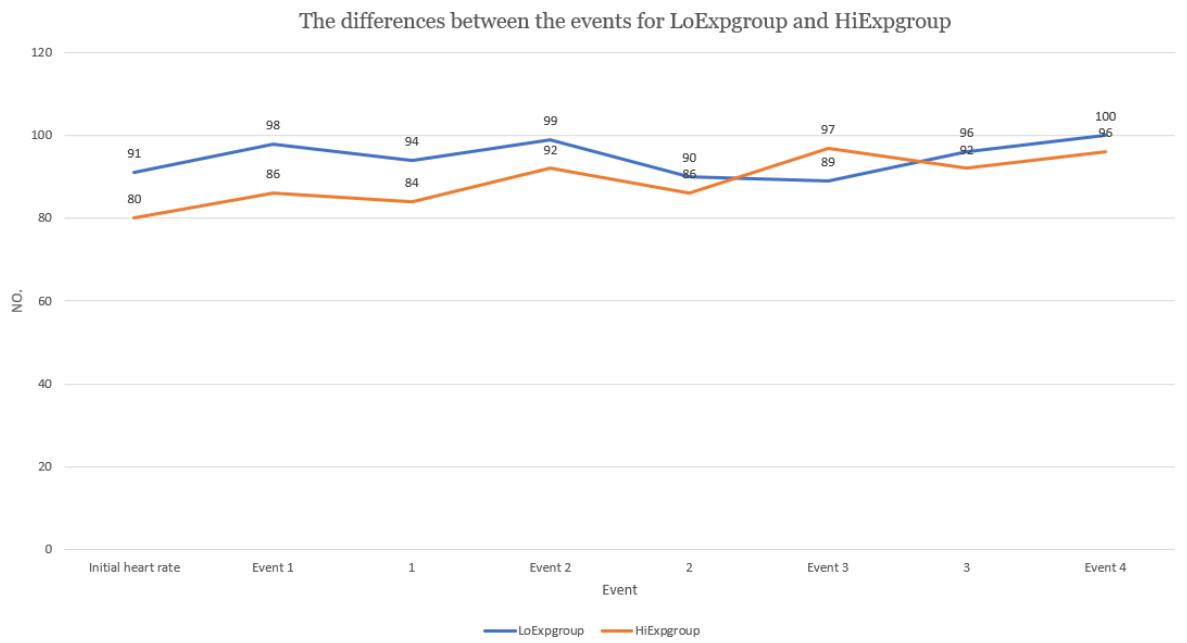


Figure 17 The differences between LoExpgroup and HiExpgroup

5.7 The impact of design aesthetics in horror games on the player experience

5.7.1 Visual Design

The design aesthetics in horror games contain both visual and auditory design. The design of horror elements present in horror games can impact players, and the artistic design of the game often gives players a visual horror effect. In the interview answers (Appendix D), I surveyed players' opinions and perceptions of the design of some elements in horror games, containing information such as monster images and character roles. Many participants liked the effect of the art style in *Little Nightmares*. The overall art style uses black and white as the primary colour of the background, and the main character's clothes use warm yellow tones; participants also expressed a preference for the image of the little girl. The game's entire worldview unfolds from the child's perspective, and the monsters are set up so that they do not visually scare players.

In the LoExgroup, many participants with low horror experience found the game mechanics of the monsters, such as jumping out of nowhere or using long hands to grab people, to be scary.

Tester 3: The monster's image fits well with childhood nightmares, and the monster gives a sense of fear. The hands are long and feel easy to grab me, and there is a sense of excitement of being chased.

Tester 4: The image of the monster is very much in line with the setting of not being able to touch it with your hands. It has long arms, and you know it should be used to grab people at a glance.

Tester 8: The monster's image is quite cute, not particularly scary and acceptable. Although he jumped out of nowhere, it was not as frightening as watching a horror movie.

Many participants found the design of the horror elements in *Little Nightmares* to be within acceptable limits, but with realistic, abstract artistic representations that reflect children's perceptions of the darkness and evil of the adult world and use this approach to show fear and confusion.

Tester6 in LoExgroup: The storyline of the game is the adult world as seen through the eyes of Roku, and the horror is different from Resident Evil or Outlast in that it is a "high" level of fear tasted through thought.

Some players in the HiExgroup commented on some of the visual designs in *Little Nightmares*, and most felt not frightened.

Tester10: I do not think it is that scary.

Tester11: Not that scary, did not feel intensely frightening images. I could easily handle the monster chase because the more nervous I was, the easier it was to get caught.

Tester12: Great interactive mechanics and the game's monster images are very creative.

In *Little Nightmares*, the player is almost always in the dark, and the only thing he can see is the lit candle held in the character's hand. The game designer controls the player's visual

limitations, adding to the pressure of the horror. This effect creates a scary atmosphere and gives the player a nervous and anxious mind. For example, *"The space is so dark that I cannot see the way ahead, and I have to keep trying to keep going through."* *"Although the background is to create a horrible atmosphere is very dim, but a little too dark, for new players is very unfriendly very easy to miss."*

5.7.2 Auditory design

This part of the analysis is summarized from the answers to the interview questions (Appendix D). There is a minimal soundtrack in *Little Nightmares*. The real fear comes from the association of the unknown, the sound of slowly pushing open the door to a room, heavy footsteps, and the roar of a monster. Hearing becomes more sensitive when vision is impaired and emits another fear of the unknown, and "Serenade" makes more use of designs about sound. Sound effects are designed to increase the player's sense of oppression. A shrill sound effect comes to mind when a long-armed guardian approaches the player, putting the player immediately on edge. The game maintains a sense of silence for the most part, and it is this sense of silence that makes the ambient sounds around you more apparent.

Tester3: The sound effects render the atmosphere well, especially the part about encountering monsters, quite in line with the horror atmosphere.

Tester4: There is no extra music. When it comes to points that will make people nervous, there will be some sound effects to make the atmosphere scarier.

Tester5: The music makes the player suddenly feel very scared while playing.

Tester11: Sound effects begin to play a rendering role when monsters arrive.

The sound effects are presented in progressive layers, and when the critical plot comes, the sound effects make the player feel tense and excited. The inclusion of music and sound effects in the game increases the player's emotional response to fear. The sound effects also motivate the player to act very carefully. Players cannot step on the wooden floor or make an ear-splitting sound, which will attract the monster's attention. For example: *"The sound effects are more horrible, the pitch is very high, so the player will suddenly feel very scary while playing nervous. For example, the blind monster with long arms is very quiet before it appears, and the sound of footsteps and touching at the moment of appearance is suddenly very high in pitch and scary."*

Ambient sounds can make players feel anxious and scared when walking in the dark, and they do not know what will happen next. When walking in a dark sewer pipe, everything is silent, and the sound of water dripping will come from all around. The sound of water dripping becomes particularly obvious. For example, *"It is great for creating atmosphere."* *"The sound effects and background music of the game fit well with the horror game. I think the sound effects are also a technique to create the atmosphere. If there is no background music, the horror effect will also be reduced a lot."* This slow-paced sound also needs to be worthy of the game designer's attention, which will be psychological anxiety and a burden for the player.

6 Conclusions

6.1 Summary

Research Question:

How do players experience satisfaction and discomfort in horror games?

The main intellectual contribution of the thesis is that the study confirms that the length of players' gaming experience and skills also affects their comfort and discomfort, as well as their satisfaction and mood towards the game.

Universally, the testers in LoExpgroup had so little experience with horror games that many of the tests failed because of in-game tricks or were scared of elements in horror games. In LoExpgroup, players' moods changed and declined most of the time. In contrast, the overall mood index of players in HiExpgroup was up. Because they had gained more success in horror games, they were not bothered by the failure of their skills. Participants in the HiExp group had more post-test comfort, success, and mood than those in the LoExp group. For the discomfort that participants get from the horror game, they get frustrated because of their frequent failures. Some participants who were able to gain satisfaction from the horror game mostly did so because they managed to pass the game and win, successfully escaped the monster, and used their intelligence to solve the puzzle. Players who achieved these things felt they gained a higher level of satisfaction—players who were familiar with the game scored high in several gaming measures. The findings were more diverse and less predictable for players with little or no gaming experience (Inal & Wake, 2022). However, some tests in the LoExpgroup do not fit this theory. In LoExpgroup, Tester4 failed a lot in the game, but his satisfaction score was high. The result obtained in the semi-structured interview was that although she felt uncomfortable, she found the game fun, and the horror was exciting for him.

In their discussion, Endress, Mekler and Opwis (2016) wrote about the satisfaction that players get from scary game experiences. Participants enjoyed experiencing typically negative emotions such as the thrill of fright, fear or anger. However, from the experiment obtained, most of the participants gained satisfaction from the *Little Nightmare* game test because they were emotionally cathartic, reacted violently, and even shouted in the face of the presence of horror elements. They released their emotions in the scary atmosphere of the horror game, achieved success through the horror game, got rid of the oppressive feeling of fear, overcame the fear and felt proud of their achievements obtained in the game. However, not all players enjoyed experiencing this negative emotion, and they still felt uncomfortable during the playtest. They cannot overcome the dark environment, they get scared of the scary elements in the game, and they do not like the feeling of being frightened. The main reasons why players get low levels of satisfaction through the game are fear and dread, and frustration because of the game's difficulty.

In addition to the emotional impact on the player, some game elements can cause a less satisfying experience. Graja, Lopes and Chanel (2020) conclude that the sound aspect of the event is the most effective in stimulating stress, anxiety, and tension. Sound can also influence the player's behaviour, and scary background elements and sound effects continue to enhance the atmosphere when some key elements are present. In terms of sound and sound effects, most testers felt that sound and sound effects played a role in rendering the horror game.

Regarding some monster images and game elements, most players will find that they like the character and art style of the main character. The monsters are designed to fit the background of the horror game, like a childhood nightmare with lots of characters. Regarding the presence of monsters, some elements in the game affect the player's gaming experience due to the improved psychological quality of most participants, who indicated a change in heart rate when encountering monsters. Data acquisition proves that some aesthetic design elements in horror games can influence the player's game experience and lead to a different view of this game due to the player's sense of experience.

In the data analysis of the game experiment, chi-square tests were conducted to test whether there was a relationship between players' experience of the game and participants' comfort, satisfaction, and mood and to demonstrate whether the results were significantly different. In testing whether there was a significant difference between players' experience of the game and players' comfort, satisfaction and mood, the data showed that there was a relationship between the amount of players' experience and both the comfort and mood that players obtained from the game, and that this difference was statistically significant. There was no significant difference in satisfaction from the game. Some players in the LoExp group were able to get through the game and gain satisfaction from the game after multiple attempts at the game, even though they had minimal experience with horror games.

Most horror game designers incorporate monsters, demons, mythological characters, ghosts and monsters from horror movies and novels into the plot of their games. The horror, violence and gore elements in some horror games can cause players to feel uncomfortable. Although more and more players are now fans of horror games, many issues still affect the horror gameplay experience. The aesthetics of the game can affect the player's experience. Game designers need to consider the design of some elements in horror games to eliminate some of the horror elements that can negatively affect players. In terms of player experience, players with low experience in the game get a different experience than players with high experience. Compared to highly experienced players, low-experienced players feel less comfortable in the game and are more negatively affected. In contrast, players with horror game experiences felt more fun and excitement in the game experience.

When the study results were analyzed for the user experience of the game, it was found that players who got more satisfaction and comfort from the game had a higher perception of the game experience. Conversely, players who were frightened too much or failed too many times during the game had a lower experience. After asking players if they would continue playing the game at the end of the test, most players were still willing to try the horror resolution genre. They would invest more emotion in the game and get satisfaction from the emotion, therefore increasing the experience of the game.

Gowler and Iacovides (2019) study further prove that negative emotions can contribute to a richer gaming experience. When players play games in the puzzle-horror genre, they must face the oppressive feeling of terror, and the brain reacts quickly to solve the puzzle and escape. During the game, players develop different emotional feelings. Despite their discomfort, they still consider the fun in the game world. When designing horror games or other types of games, game designers need to pay attention to the choreography of game mechanics and the design of elements to see if certain elements will cause discomfort, the game's overall experience, and the difficulty of the game suitable for the players.

Many inspirations for making horror games are also born from horror movies by discussing horror games in the background. Horror games and horror movies have great relevance to the backstory of horror movies which helps game designers to make horror games. In the background, the type of fear in horror games is divided into psychological fear and fear of the unknown, but there are more than these two types of fear in horror games. Some examples of good horror games are given in the background for reference, and there are many good horror games worth analyzing. The game model "*Little Nightmare*" used in this experiment also contains both types, so both psychological fear and fear of the unknown are addressed in this study. In the test, consideration was given to what factors in a player's gaming experience might be influenced by a horror game. In addition to the aesthetic design of the horror game itself, personal factors such as the player's personal gaming experience and the sources of player satisfaction and dissatisfaction were investigated. The survey summarized the negative factors in the player experience that could improve the game, thus further contributing to a richer and more enjoyable experience. When designing horror games, game designers can fully consider aspects such as players' comfort, satisfaction, discomfort, and aesthetic design, thus significantly enhancing players' gaming experience in horror games.

6.2 Discussion

The shortcomings of this study are mainly due to the limitations of the sample. The data source of the sample is college students and youth groups, and the sample data has some limitations, which may lead to bias in the calculation of the data of the sample. In addition to this, the data samples are of similar nationality, age and gender, which may lead to some bias and similarity in the study results.

Players who have little experience with horror games have minimal experience, resulting in minimal experience with the game's story in the limited time they have. As a result, some critical event points were not recorded. Given the varying levels of mastery and gaming experience of the testers, it is essential to keep this in mind when designing the experiment.

The heart rate testing devices used in biometry may have some drawbacks. When conducting experimental tests, the player's wrist has to constantly check the heart rate test data due to the limitations of the device, and this behaviour may distract the player. However, the interaction between the user and the biometric device may significantly affect the gaming experience. In the study of horror games, biometrics is suitable for investigating which event points players will react strongly. Some of the players' physiological reactions will give the user-researcher more data to study.

Since terror is a purposeful emotion, it measures potential tension and stress (Graja, Lopes & Chanel, 2020). Although some players are not averse to the emotion of fear, most of them are still uncomfortable with it. They have little experience with this fear type of game, and the biometric data seems to depend heavily on what game type they are comfortable with. *Little Nightmares* is mainly about puzzle games, which do not have so many horror elements, no gore, violence and other elements. *Little Nightmares* does not reflect a lot on the design of ambient music, reflecting more about the sound effects in the game, and when asking players about the aesthetic design sound aspect, players replied that they did not hear more music. Considering that many participants were low-experience players, selecting levels was not chosen to be difficult, which may have led to biased data. The test location's environmental factor also affected the testers' emotional data, as a dark environment was chosen, so some

participants may have felt uncomfortable playing horror games in a dark environment. Secondly, players were required to conduct interviews immediately after the playtest to recall the events they had just experienced. This plan was intentional to make players feel uncomfortable, and such significant issues also need to be considered and reflected upon.

6.3 Future Work

The number of users used for playtesting will increase, and some more participants with experience in fear-based games will be recruited. The duration of the game experiment period will also be extended so that players will get more time for game testing and can experience more events. In terms of heart rate testing, future studies will need to consider other devices to deliver the data. The game model used by Dekker and Champion (2007) in their study was a single-player game. Because it generates less variability and potential problems in assessing the user experience, multiplayer or writing games may affect the player's reactions and biometric information through the number of other users worldwide (Dekker & Champion, 2007). Therefore, it is also more difficult to conduct experiments with multiplayer horror games. Many multiplayer games in the horror genre can be explored by friends together. However, when exploring the user experience of horror games, one can also consider the multiplayer aspect, how the player's experience will change in the social realm, and how face-to-face collaboration between players and friends for gaming changes. Many more representative works with horror elements in horror games have not been selected and experimented with. However, future work can consider other types of horror games, such as the survival horror category. Secondly, user research and other types of games can also be studied. Horror games need to consider more ethical issues because they always put players in uncomfortable environments. There are also more types of emotions that can be explored regarding user emotional responses and how more other types of emotions can bring discomfort and comfort to the player.

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Appendix A

Demographic Interviews

1. How old are you?
2. How often do you play games?
3. What devices do you usually use to play games?
4. What would you say is your favourite type of game?
5. Have you ever been exposed to horror games before? If so, how much experience do you think you have? (1 - Never played a horror game 7 - I am a big fan of horror games)
6. In real life, do you feel fear easily?
7. how are you feeling right now? rate it 1-10 (1-Bad 7-Good)
8. have you ever played the game "*Little Nightmares*" before?

Semi-structured interviews

1. How are you feeling right now? Please describe Rate it 1-10 (1-Bad 7-Good)
2. Do you feel comfortable now Rate it 1-10 (1- Anxious 7-Very relaxed)
3. If you feel a little uncomfortable, what is the cause of that discomfort? Or what elements of the game made you feel uncomfortable?

What do you think of the game? Describe in detail and rate it 1-10

5. Were there any elements of the game that you liked or disliked in the episode you just experienced? (e.g., sound, story, art, camera work, puzzle solving, etc.)
6. Do you have any comments on the sound effects and background music in the game? Can you give examples?
7. Do you have any comments on the monster imagery or gameplay mechanics in the game? For example, when the long-armed keeper suddenly jumps out of the darkness.
8. Did you get a sense of satisfaction from the game? Why, Rate it 1-10 (1- No 7-Yes)
9. How difficult did you find in the game to be in this horror puzzle game?

10. Having just played one chapter of the game, do you think you would like to continue playing the game? Why not?
11. Was there anything in the game that confused you?
12. Do you have any suggestions for improving the game?

Appendix B

Tester1

Event Progress Serial Number	Description of the event	Event Impact Check	Results
1	Touch the lift switch and the lift starts to descend	Can the player find a switch to turn on using props	YES
2	Six starts to get hungry and looks for food in the cage and is suddenly caught	The player's facial expressions, reactions	YES
3	Six encounters a long-armed keeper (boss) being cleared, Six looks for a way through	Whether the player can successfully pass through and successfully evade	YES
4	Six encounters the monster in the shoe pile	Whether the player can successfully pass through and successfully evade	YES
5	Six faces the long-armed administrator who suddenly jumps out and finds a way to dodge	Whether the player can successfully pass through and successfully evade	YES
6	Six used the toy to lure the long-armed keeper away, climbed onto the bookshelf and escaped	Whether the player can successfully pass through and successfully evade	YES
7	Six has to use the props to open the door and successfully evade the long-arm manager's pursuit	Whether the player can successfully pass through and successfully evade	YES

8	Players enter the library to find the exit, but also avoid the long-arm administrator	Whether the player can successfully pass through and successfully evade	YES
Event progression number	Players experience time points (MIN)	Player Heart Rate (NUM)	
1	04'26	84	
2	09'27	90	
3	12'32	100	
4	15'56	103	
5	17'51	87	
6	18;27	87	
7	20'52	87	
8	23;32	82	

Tester3

Event Progress Serial Number	Description of the event	Event Impact Check	Results
1	Touch the lift switch and the lift starts to descend	Can the player find a switch to turn on using props	YES
2	Six starts to get hungry and looks for food in the cage and is suddenly caught	The player's facial expressions, reactions	YES
3	Six encounters a long-armed keeper (boss) being cleared, Six looks for a way through	Whether the player can successfully pass through and successfully evade	YES
4	Six encounters the monster in the shoe pile	Whether the player can successfully pass through and successfully evade	YES
5	Six faces the long-armed administrator who suddenly jumps out and finds a way to dodge	Whether the player can successfully pass through and successfully evade	YES
6	Six used the toy to lure the long-armed keeper away, climbed onto the bookshelf and escaped	Whether the player can successfully pass through and successfully evade	NO
7	Six has to use the props to open the door and successfully evade the long-arm manager's pursuit	Whether the player can successfully pass through and successfully evade	NO
8	Players enter the library to find the exit, but also avoid the long-arm administrator	Whether the player can successfully pass through and successfully evade	NO

Event progression number	Players experience time points (MIN)	Player Heart Rate (NUM)
1	05'47	84
2	08'47	97
3	09'52	93
4	10'14	99
5	13'26	95
6	16'48	90

Appendix C

Hello! Thank you for your interest in taking part in my research. The research I am currently doing is on horror games, so if you are not resistant to horror games, you are welcome to come and take part and have a gaming experience. If you do, I will need your informed consent to participate. The game prototype used in the study is Little Nightmares, and there will be two interviews in the game study, which will be recorded using audio recording equipment for data analysis. Any recordings and videos will be deleted after the study is completed. Your interviews will be published in quotations and data in my thesis, but no personal information or names will appear. All data will remain anonymous. During the study, you will be fitted with a sports watch that records your heart rate to facilitate the researcher's recording of heart rate data. Participation is entirely voluntary, and you can opt-out at any time after participation. All data obtained will only be used by me for my dissertation study.

Appendix D

	Semi-structured interviews Q3: Reasons for discomfort	Semi-structured interviews Q8: Sense of satisfaction
T1	It feels like the game is fun. But it can be a little uncomfortable as it requires the player to use death to get information about the level's objectives, and I would die a lot.	Satisfaction after clearance.
T2	I got caught a lot when I was just trying it out and often came close to passing it.	I have failed too many times.
T3	The handling was too difficult, the environment was too dark to see my surroundings, the monsters were too sensitive and I was always getting caught and I had some frustration.	Too many failures.
T4	The monsters are strangely proportioned, the graphics are not clear and the action is not smooth.	Because it's actually easier to be scared, there's a sense of excitement and the joy of solving the puzzle successfully.
T5	The reason for the discomfort is firstly the dark environment, which naturally creates a feeling of fear when sight is obstructed, and then the monsters of various strange proportions that fill the room, as well as the giant panic attacks caused by the various huge things in contrast to the game's protagonist, which naturally makes people feel uncomfortable.	There's a certain satisfaction in playing the current part, as it feels like you're the one trying to figure out how to escape the creepy and scary ship, and each level you pass is a great sense of achievement.
T6	Didn't feel uncomfortable and loved it.	The difficulty level is not too great and can be passed with simple trial and error without much challenge.
T7	Don't like being caught up in game design.	Don't really get satisfaction from horror games.

T8	The darkness caused me discomfort, especially with the sound effects and the awful music, and my handling was not very good. I couldn't feel comfortable, I was too tense, I couldn't feel relaxed, I couldn't release my emotions although I enjoyed the puzzle part, but my skills were too poor and it was too difficult for me, but I enjoyed this little game with adventure.	Makes me too tense and I can't feel relaxed enough to release my emotions.
T9	I feel nervous and I panic when the monster catches up to me. In the face of unknown darkness, I don't know what's going to happen next. So, I feel a bit uncomfortable.	I keep failing and have a sense of frustration.
T10	Game scenes are not scary, no experience.	The game felt simple and was easy to get through.
T11	There was no discomfort, I enjoyed the thrill of horror games, exploring unknown things in the dark and the sense of achievement I would get after solving a puzzle to get through it.	I can feel some horrible oppression in the game, and I feel a sense of satisfaction and achievement after I have dodged the monsters and cracked the levels.
T12	I love horror games, there are elements of gameplay in them that I love and I love the thrill of playing them.	Because it is naturally satisfying to finally pass the level after dying several times and to experience the full plot.
T13	The game failed too many times and was very tense during the game.	Get over the level, solve the puzzle and get a sense of satisfaction.
T14	The game's sense of atmosphere and level design is captivating.	The satisfaction of going on an adventure and experiencing a story in person.
T15	No discomfort, there are sudden scary parts in the game that have been scary.	A great feeling of accomplishment after playing the game.

	Semi-structured interviews Q5: Elements to like or dislike	Semi-structured interviews Q6: Music and sound effects	Semi-structured interviews Q7: Monster images and game mechanics
T1	Very interesting, especially as many levels have multiple solutions.	It feels like the sound effects are the main thing. Sound effects make up the main horror element.	There are fewer gameplay mechanics, but they are adequate as a horror game.
T2	The user experience is not very good, I don't really like the button action of the game. The interaction mechanics are not very smooth.	The sound and sound effects feel quite appropriate for a horror game.	Quite good, quite in keeping with the setting of a horror game.
T3	The horror atmosphere is quite well done, and the art style is quite interesting. The camera following is not very sensitive, and if you don't get too comfortable with the operation, you will easily get stuck on the door and can't crouch down.	The sound effects render the atmosphere well, especially the encounter with the NPCs, which fits the scary atmosphere quite well.	The monster image fits well with childhood nightmares and the image gives a feeling of fear. The hands are long and feel easy to catch the player with a sense of excitement of being chased.
T4	I like the puzzle setting and the pace of the game, and the art has the main character colored and shaped like a little banana.	There is no unnecessary music, and when it gets to the point where it will get tense, there are some sound effects that are more conducive to a scary atmosphere.	The image fits well with the setting of not being able to see the groping with the hands, which are so long that at first glance you can tell that it is supposed to use them to grab people.
T5	What I particularly liked was the setting of some of the tiny mechanisms, very clever and a great experience when playing, what I didn't like was the	The background music is rather eerie and high pitched, making the player nervous while playing and suddenly it can be scary. For example, the blind monster with long arms	The monsters are set up to be scary and appear suddenly and unexpectedly, highlighting the thrilling nature of horror games.

	ugly and scary design of the monsters.	is quiet before it appears, and the sound of footsteps and touching at the moment it appears is suddenly very high pitched and scary.	
T6	The game's storyline is an adult world revealed through Six's perspective, a horror that differs from Resident Evil or OutLast in that it is a "high" level of fear tasted through thoughtful reflection.	The soundtrack is not great and does not add or detract from the horror atmosphere, it is a moderate soundtrack.	The game doesn't create a sense of horror by accidentally showing the scary side of the monster; the appearance of the long-armed keeper is to be expected.
T7	The art is beautiful, the camera work is immersive, the puzzles are not too difficult, and the other elements are too scary for me.	It sets the mood and fits well.	The monster images are distinctive and the size contrast feels quite scary.
T8	I like the little yellow girl, she feels evil, but cute at the same time. The game is a little too difficult to decipher, I may need to practice for ages to get through it.	Very atmospheric and emotionally progressive.	The monster image is quite cute, not particularly scary and acceptable. Although he jumped out of nowhere, it wasn't as scary as watching a horror movie.
T9	The art style is nice and I like the graphic design of the main character, but I don't really like the dark setting in it.	The sound effects and background music of the game are very much in line with a horror game. I think the sound effects are also a way to create atmosphere, and without the background music, the horror effect would be much less.	The monster figure is much larger than the protagonist, and the contrast makes the protagonist seem weak. The local features of the monsters are exaggerated and designed in an interesting way, like a dark fairy tale.

T10	I like the puzzle-solving method and the art is good.	The soundtrack feels generic, but it fits well for a horror game.	I didn't find it that scary, The Loneliness felt more likely to generate a sense of horror.
T11	I loved the game's scenic design, dodging monsters in the library and being able to climb bookshelves.	The sound effects start to take on a rendering role as the monster arrives.	It wasn't that scary, didn't feel intensely frightening images. I could handle it easily, the monster chase, because if you are more nervous you are more likely to get caught.
T12	I love the soundtrack, which gives the player a sense of immersion, and the whole plot of the game is complete and fantastical, making it resonate with the player.	The sound effects are very much in keeping with the game and the setting of the story.	Great interactive mechanics and the game's monsters are creatively portrayed.
T13	The game footage is more interesting, the puzzles are generic, and there just aren't as many parts to solve as there are to dodge the monsters.	The sound effects and background music are quite good.	The monster image is quite well designed, with short legs and long hands, using long hands to grab people, which is more distinctive.
T14	The puzzle elements are moderately difficult, the dark atmosphere is immersive, and the soundtrack works just as well.	The rendered environment is spot on and suits the game itself well.	The gameplay mechanics are relatively few, but they are adequate for a horror game.
T15	Loved the art and the puzzle part.	Fits the scene well.	It's scary to jump out of nowhere, but that's what horror games are all about.

	Semi-structured interviews Q10: Will the game continue?	Semi-structured interviews Q11: Confusion	Semi-structured interviews Q12: Suggestions for improvement
T1	Willingly, I found it interesting, so I will continue with the experiment.	At one point, the player is required to use death to get information about the level's objective. The space was so dark that I couldn't see the path ahead and I had to keep making attempts to keep going through. There was less confusion.	Hopefully there will be more environmental hints in the levels so that players know the objective information for the level.
T2	Willingly, I just wanted to get through the chapter I just played and then stop playing. The satisfaction I get from the game is not very high because the action causes me to always fail.	No.	Improve the game's UI and interaction.
T3	Yes, but I'd like to start playing again and get familiar with the gameplay.	Sometimes I don't know what I'm supposed to be doing.	It feels like it could do with a reset of the operating button, which is not very smooth.
T4	Willing	Occasionally the operation is not smooth, but it may be that you are not used to it.	No.
T5	I was willing to continue playing because I had already subbed myself into this main character and wanted to know what new monsters I would encounter if I continued playing and to figure out the world and the causes and consequences of the	Why is the main character hungry? How did these monsters get here? Why is the protagonist trapped here again? What outcome awaits the protagonist at the end? The plot can only be understood on its own.	Personally, although the background is dimly lit to create a scary atmosphere, it is a bit too dark and very unfriendly for new players who can easily miss.

	main character's entry into this wheelhouse.		
T6	Willingly, the game storyline is more appealing to me.	No.	The game is more of a puzzle game, with fewer horror elements and a soundtrack that is not particularly good.
T7	No, I prefer a more relaxed game.	Not really, very good horror game, just not for me.	The archive points could be articulated a little more closely and could greatly improve the gaming experience.
T8	No, because I was too nervous and scared.	There are some parts of the decryption that I don't quite understand, there's a climb up that I can never get into and I don't know what's going on.	Could have added some more gruesome elements to the game, to the extent that I was afraid to look at it.
T9	Willingly, I'd like to see what the later episodes are like, and I'll get better at it regarding the action.	I often didn't know how to go through it and was a bit confused about the puzzle aspect, often staying for a long time.	The handling of the game should be improved a bit, it often fails due to button mashing. Some more scary elements could also be added.
T10	No, there was nothing more that appealed to me.	No.	It is suggested that more horror elements be added to set the mood of the game.
T11	Willingly, I enjoyed the dark fairy tale style of gameplay, which doesn't instill fear in the player through sudden scares, unlike other horror games.	There are many props and items in the game, but they cannot be interacted with by the player.	For game sound effects, it could be a little scarier.
T12	Willingly	No.	I hope that the game adds more game mechanics and adds more game interaction to the player, using the fact that more

			interaction can be created between the player and the object.
T13	No, because it's scary to play	Plot is not understood.	No.
T14	I am willing, still want to know more about the later episodes.	No.	No.
T15	Willingly	No.	No suggestions, it's a good game.

Appendix E

Group1	Experience with horror games	Comfort from the game	The satisfaction gained from the game
Tester2	3	2	3
Tester3	1	2	4
Tester4	2	2	7
Tester6	2	6	6
Tester7	2	4	1
Tester8	1	3	2
Tester9	2	2	4
Tester13	2	3	3
Tester14	3	6	6
Group2	Experience with horror games	Comfort from the game	The satisfaction gained from the game
Tester1	6	6	6
Tester5	4	4	6
Tester10	6	2	3
Tester11	4	6	6
Tester12	6	7	7
Tester15	4	4	4

Group1	Mood index before playtesting	Mood index after playtesting
Tester2	6	2
Tester3	6	4
Tester4	7	2
Tester6	5	5
Tester7	7	6
Tester8	4	3
Tester9	6	2
Tester13	6	3
Tester14	6	6
Group2	Mood index before playtesting	Mood index after playtesting
Tester1	3	6
Tester5	6	6
Tester10	4	4
Tester11	4	6
Tester12	6	7
Tester15	4	6