

Sound, Light, and Narrative: A Study of Horror Effects in Horror Game Environment Design—The Case of Rusty Lake

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Abstract: In recent years, horror games have gained popularity due to the evolution of player needs and preferences. The success of these games depends on creating an immersive atmosphere, capturing player attention, and delivering an exceptional gaming experience. However, scholarly investigations into the psychological impacts of specific design elements (e.g., auditory cues, lighting techniques, and narrative frameworks) remain limited. This study innovatively focuses on Rusty Lake, a 2D low-fidelity-style game, and analyzes how its ambient design enhances horror and player immersion. Precision in environmental design and atmospheric construction directly correlates with heightened perceptual realism in horror game experiences. Strategic integration of diegetic soundscapes and dynamic lighting systems enables developers to construct visceral horror atmospheres with higher efficacy. Through the analysis of Rusty Lake, this paper concludes that exquisite auditory cues, simple visual styles, and carefully designed narrative structure can significantly enhance psychological tension, which is the key to maintaining immersion and the horror atmosphere.

Keywords: Horror, Game design, Environment, Players' psychology, Rusty Lake series

1. Introduction

In recent years, as societal development requirements have progressively heightened, individuals have experienced increased psychological pressures. Consequently, engaging in horror games has emerged as an effective method for stress relief; this leads more people to try horror games and develop a lasting interest in them. The Immersive Horror Games Market was valued at USD 17.39 billion in 2024 and is projected to grow to USD 22.73 billion in 2025, with a CAGR of 32.30%, reaching USD 93.32 billion by 2030 [1]. According to Sensor Tower data, several horror mobile games in the U.S. achieved outstanding performance in Q2 2024. For instance, Dead by Daylight Mobile amassed 319 K downloads and reached 27.8 M weekly active users, while Identity V peaked at 312 K downloads and 3.3 M WAU [2]. Previous studies have demonstrated the importance of audiovisual elements in creating a horror atmosphere. Sound design has been demonstrated as a fundamental building block of fear in interactive contexts [3]. Evidence also indicates that horror lighting effects elevate players' fear levels more significantly than sound effects. The effective use and tandem of horror lighting and sound effects in horror games can greatly increase the level of

fear in the players' mind [4]. However, how to skillfully combine all the relevant elements and present a unique art style to control players' psychology needs further exploration.

Starting from Rusty Lake, this assignment discusses the significance of atmosphere building for horror games. Although many studies have explored individual components such as sound design or visual cues in horror games, there still remains a lack of comprehensive analysis on how these elements interact with narrative structure. This study attempts to fill this gap by focusing on low-fi art style, static horror and so on, offering a new perspective on how horror is structurally designed. Furthermore, whereas prior studies predominantly analyze 3D games, this paper focuses on 2D games, thereby enhancing the comprehensiveness of terror atmosphere construction analysis. Studying the environment design and atmosphere construction in horror games can not only enhance game immersion and emotional experience, but also provide scientific design methods for game developers to optimize players' psychological engagement.

2. Fear and motivation: the psychology of horror game players

In horror games, players often feel scared by certain elements, while these fears are carefully designed to be safe, making players willingly expose themselves to those terrifying experiences. This phenomenon, also described as "safe fear", often activates the body's fight-or-flight response, induces a certain level of tension among players, and makes their palms sweat and their heart rate increase, while ensuring the safety of their physical well-being in the real world at the same time [5,6]. This kind of fear offers players a unique psychological escape, especially for individuals who live in today's high-pressure and fast-paced society [7]. They are allowed to escape from the real world and release their negative emotions in a harmless way. In 2013, Paul Rozin and colleagues introduced the Benign Masochism Theory, which posits that individuals derive pleasure from experiences including pain and threats when they recognize these stimuli as safe and manageable, exemplified by activities such as consuming hot cuisine, viewing horror films, and engaging in horror video games. The fear metamorphoses into excitement instead of a menace, prompting the brain to secrete dopamine and other pleasurable compounds, resulting in an elevated mood. Moreover, numerous horror games integrate puzzle-solving elements into the gameplay, stimulating players' want to perpetually investigate the unfamiliar. This allows players to maintain ongoing immersion in that reality. Upon resolving the narrative's enigma, participants' prior anxieties metamorphose into elation, imparting a sense of accomplishment.

3. The element of terror

The Rusty Lake series tells the tragic stories of the Vanderboom and Eilander families. In their pursuit of immortality, they make the same magic potions or perform sacrificial rituals. The two families soon fall into a curse and endless reincarnation. This game is a 2D adventure with a unique art style, resembling hand-drawn illustrations. The graphics are simple, and the overall tone is rather gloomy. Players need to find the hidden clues in the room, and follow these clues to solve passwords or uncover a story. In this game, the timeline can sometimes be disrupted and the locations also change. Players need to find the key to solving the puzzles in different time and space locations. During the process of solving the puzzles, there are many elements that can evoke a sense of terror for the players.

3.1. Emotion through soundscape design

In Rusty Lake, as players explore and solve puzzles, the background music is often soothing. However, it is worth mentioning that although these pieces of music are simple, they often contain some strange sounds, giving the background music a bizarre feel and making the game even more mysterious. Sometimes, there will be some specific sounds that suddenly ring out, accompanied by a sudden appearance of a dark shadow or an unexpected attack. Usually, after completing a puzzle and relaxing, the suddenly ringing music creates a powerful intimidating effect. Occasionally, when players activate pivotal moments, the game may abruptly introduce a jarring sound, reminiscent of shattering glass, distorted cassettes, or profound rumblings, disrupting the suspense and eliciting a momentary shock [8]. In one of the Rusty Lake series, Seasons, players should use an astronomical telescope to observe the moon. While they are observing, they are immersed in tranquil summer night ambience, hearing cricket chirps and wind sounds. When they focus on the room on the lunar surface, the audio suddenly shifts. Discordant string glissandos and sub-bass rumbling pierce through, synchronized with the flashback of Laura's throat being slit by a dark shadow. The sudden sound rupture shatters mundanity, creating a jump-scare effect, evoking profound unease and a sense of guilt in players. In addition to background music and sudden audio shocks, the game also employs subtle environmental sounds such as the wind blowing, the humming sound of old light bulbs and birdcall to create a constant sense of unease. In certain scenes, faint whispers, laughter and sighs can enhance players' feelings of tension and isolation. In Rusty Lake: Paradise Island, players will encounter relentlessly intensifying fly buzzing sounds with viscous squelching effects. When David transforms into the "Fly Man", players can hear a very intense scraping sound of the insect exoskeleton and a deep growling sound. The high-frequency buzzing noise triggered a strong sense of anxiety, while the altered sounds intensified the tragic horror atmosphere. Sometimes players can also hear continuous mechanical noises, which can give them a strong sense of oppression and make them feel extremely tense. These sounds create an atmosphere that is "even more disturbing than terror", being so quiet that it feels unnatural, like the calm before a storm. These carefully crafted soundscapes do not simply accompany the gameplay; they can manipulate the players' emotions, playing a significant role in controlling players' emotions and their terrifying experiences.

3.2. Lighting for mood and immersion

Lighting plays a significant role in creating a suitable atmosphere and shaping players' mood [9]. Light defines the players' field of vision by strategically revealing 'essential clues', concealing 'hidden threats', and highlighting 'paths to explore', thus directing their attention [10]. Darkness heightens fear by limiting the players' awareness and evoking the primal anxiety of the unknown. Players lose spatial orientation, plunging them into helplessness and vulnerability. If players perceive light in the distance, it can evoke a profound sense of relief. Opposite to darkness, light always represents hope, calm and safety. Therefore, light can also play a role in guiding players to find crucial information and helping them determine the direction. When the lights suddenly go out, this usually serves as a warning to the players that some danger is about to occur. The players might become nervous due to this sudden change, and at the same time, they will feel that the change has come very quickly, alerting them to make the right decision as soon as possible. Flickering or color-shifting lights further manipulate players' emotions, amplifying tension or unease. In Rusty Lake: The White House, if the players want to leave the mental hospital, they need to perform certain actions according to the instructions on the paper. After that, the alarm in the room will be triggered,

and the red lights will start flashing. Then, the doctor will come in and warn the players. These lighting shifts exert intense psychological pressure, triggering immediate nervousness and unease.

3.3. Create a terrifying atmosphere through details

3.3.1. Low-fi art style and "static horror"

In horror games, the low-fi art style refers to a visual approach which is simple and even rough. Instead of aiming for realism, it creates an unfamiliar and unsettling atmosphere, encouraging players to fill in the blanks of the pictures and scenes through imagination. This aesthetic appears in other games as well. Sally Face, for instance, adopts a deliberately crude and distorted hand-drawn style, creating an uncanny atmosphere. These games, like Rusty Lake, choose to adopt a low-fi art style not because of technical limitations, but in order to enhance the unreality of the game and create a psychological sense of fear for the players. By obscuring details and distorting reality, they evoke fear through implication rather than explicit depiction. It encourages players to imagine in order to fill in gaps, which often leads to a deeper horror experience. Low-fidelity art style [11] makes the characters' movements appear rigid as if they are puppets being manipulated. The characters in the game do not have many actions, and in many scenes, they even remain still. However, some scenes that seem completely still on the surface may reveal something different when you look at them a second time: perhaps a dark shadow appears outside the window, or the expression of the person in the photo changes. The style makes the game look old and mysterious, and the kind of static horror casts a layer of silent and eerie atmosphere over it [12].

3.3.2. Abnormal character expressions and actions

In Rusty Lake, the characters' expressions are frequently static, devoid of authentic emotional variations. They sacrifice their familial relations for the sake of immortality. They exhibited no emotion as their family members were being sacrificed. When repugnant insects emerged from their lips or other orifices, they exhibited minimal reaction. One may assert that regardless of how bizarre or terrifying circumstances become, these personalities maintain an expressionless demeanor and an unsettling tranquility. Moreover, certain characters will abruptly engage in entirely unforeseen actions. A character may gaze at the player for several seconds before vanishing or abruptly advance towards the screen following an extended stillness. One of the most disturbing examples is in Rusty Lake; Hotel, players have to kill one animal guest each day and use specific part of their bodies to prepare exquisite meals for the remaining guests. During dinner scenes, the guests casually enjoy the food, chatting pleasantly, with complete emotional indifference. When these things that go against the logic and morality of our lives occur, players may be surprised and uneasy by these strange occurrences. These abnormal expressions and actions not only make the events told in the game seem strange, but form psychological fear among players and create a terrifying atmosphere.

3.3.3. Bizarre game plot: "the familiar becomes strange"

In Rusty Lake, familiar things in the game become strange and unsettling. You'll see a normal dinner turn into a feast of human organs, with people eating them with great relish. Ordinary people suddenly transform into animals. The most extraordinary part is that people here can achieve immortality through some strange rituals, or their souls still exist after death in this world. The normalization of the abnormal creates a deeply unsettling atmosphere. Instead of feeling afraid or confused, the characters have seen these events as part of their everyday life. The horror is not only

in what happens, but also in how no one seems to notice that something is wrong. When the ordinary world no longer behaves in ordinary ways, the players will question everything they see. The horror creeps into players' minds slowly; when they suddenly realize it, they may even break into a cold sweat.

3.4. Narrative structure

In horror games, narrative structure plays a vital role in shaping players' emotional journey. Both linear and non-linear narrative structures are widely employed, each with its own advantages. Linear narratives make the story's narration clearer. This structure is highly effective in creating a gradually escalating sense of tension, guiding players through a clear buildup process and enabling them to eventually understand the truth. In contrast, the non-linear narrative structure brings about uncertainty and a sense of disorientation. This lack of clarity enhances psychological fear by making players question what they know and what they have missed. This approach prioritizes player-driven exploration and subjective interpretation. Fragmented information dispersed across the game world transforms the narrative into a realm of ambiguity, where fear arises not just from what happens, but from how the story unfolds. The tension lies in the gaps and the exploration process. The story unfolds across different time periods and generations, requiring players to connect different detailed information, cryptic symbols and family histories. As players uncover more truths and discover those facts that were deliberately concealed, they will gradually feel a sense of fear. This process is exactly what we are aiming for. Moreover, in games such as *Rusty Lake*, players are required to perform dreadful tasks like killing a parrot or cutting off someone's ear in order to progress in the game. When players realize that their actions make things worse or that they cannot change the ultimate outcome, they feel both scared and helpless. This sense of complicity makes players feel that they are harming instead of helping. When they realize that they themselves are also participants in the horror, they will feel a deep-seated fear within themselves.

4. Conclusion

In conclusion, the creation of immersive and psychologically engaging horror games relies heavily on well-designed environments and atmospheric elements. This research has explored how lighting, sound, and overall atmosphere contribute to player immersion and emotional responses. By analyzing different game styles, player preferences, and industry insights, we have identified key factors that enhance the horror experience. This study is based on the analysis and comparison of individual classic games to get a conclusion; it doesn't include all types and styles of games, and it focuses heavily on visual and narrative elements, while paying less attention to player interaction mechanics, so the conclusion may not be perfect. A major constraint is that, with the further advancement of associated technologies and equipment, the integration of VR and other technologies with horror games may emerge as a popular alternative. Future research may investigate varied modalities of horror game design by analyzing player interactions within horror settings, encompassing character movements and in-game decision-making mechanisms. To obtain a more profound understanding of the psychological effects of horror games, approaches including questionnaire surveys, behavioral analysis, and player interviews may be utilized. These methodologies would facilitate a more thorough comprehension of how contextual and interaction factors influence player immersion and emotional reaction.

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