

Haunted Hollow
Player Agency, Restriction and Player
Engagement in Horror Game Design

Master's Thesis (KISPECI1SE)

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Abstract

This thesis investigates how confined, linear corridor-based level design can sustain player engagement and perceived involvement in a horror game when player agency is deliberately restricted. The project challenges a dominant assumption in game design theory, that meaningful player engagement requires meaningful player choice, by treating restriction itself as a primary design mechanism.

The investigation produced *Haunted Hollow*, a first-person horror walking simulator developed as a playable prototype. The game places the player in the role of a content creator livestreaming an exploration of an abandoned mining adit whose workers disappeared without explanation decades ago. Structurally, the game offers no branching paths, no means of retreat, and no conventional defensive tools; the only available direction is forward. As the player descends, the environment grows increasingly hallucinatory, and a simulated livestream audience, mediated through a fictional brain chip, begins to exert direct physical control over the player character's body.

The theoretical framework draws on scholarship in player agency and restriction, player involvement and immersion (including Calleja's Player Involvement Model), and the spatial design of horror, to argue that dread is a more durable vehicle for horror engagement than shock. Dread here refers to a sustained affective state generated by anticipation rather than confrontation, and linear confined environments are uniquely suited to producing it.

The prototype was evaluated through an exploratory user study with eight participants, combining post-play surveys, semi-structured interviews, in-game telemetry, and researcher observations. The most consistent finding across all data sources was the disproportionate contribution of the simulated chat system to player engagement: despite being pre-scripted and incapable of genuine reactivity, it produced measurable behavioural and emotional shifts, functioning as the primary compensatory mechanism for restricted agency. Atmospheric and environmental qualities of the adit constituted the second major contributor, with curiosity emerging as the dominant emotional state and spatial and sound design consistently cited as sources of tension and sustained forward engagement.

The thesis concludes that atmospheric immersion and the perceived social responsiveness of a simulated audience can together sustain meaningful player involvement even under conditions of near-total agency restriction, with implications for horror game design and for broader theories of player engagement in constrained interactive systems.

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Keywords and Acronyms

Player involvement model (PIM)

PC (Playable character)

Large Language Model (LLM)

1 Introduction

Horror as a genre has long depended on one fundamental condition: the audience’s inability to look away. Whether through the formal constraints of a darkened cinema, the captive immersion of reading a horror story, or the participatory architecture of a horror game, the most enduring entertainment structures built around fear have shared a common logic: the experience is most effective when the subject cannot simply step out of it. This thesis takes that observation seriously, and uses it as the premise for a game.

Haunted Hollow is a first-person horror walking simulator developed as a playable prototype by a two-person team. The game casts the player as a content creator livestreaming an exploration of a forgotten mining adit whose workers disappeared without explanation decades ago. The player character carries no conventional tools of self-defence. They cannot hide, backtrack, or choose an alternate path. The only direction available is forward. As the player descends deeper into the tunnel, the environment begins to behave inconsistently, the livestream audience grows increasingly invested, and the boundary between the horror the player character is performing and the horror they are experiencing begins to dissolve.

The prototype is built around a deliberate research provocation: that meaningful player engagement does not require meaningful player choice. This runs against a significant strand of game design orthodoxy, in which player agency, understood as the ability to perform consequential actions within a designed system, is treated as a prerequisite for sustained involvement (Juul, 2005; Mateas and Stern, 2005). Horror games, however, have long exploited the inverse. Restriction, uncertainty, and the withdrawal of control are among the genre’s most reliable tools. The question this thesis investigates is not whether restriction can produce engagement, but how, and through which specific design mechanisms.

The formal research context for this investigation is the corridor. The adit, a horizontal mine tunnel with no branching paths, no dead ends, and no means of retreat, provides the spatial structure through which all other design decisions are channelled. This structural choice is not incidental. As the theoretical framework established in Section 3 demonstrates, confined and linear spaces produce a particular kind of horror: one grounded not in direct confrontation but in the sustained anticipation of something that has not yet arrived. By concentrating the player’s movement into a single axis, the design removes the spatial grammar through which games typically communicate agency, and asks what remains.

What remains, in *Haunted Hollow*, are three primary systems: a simulated livestream chat that reacts to the player’s progression, a donation system that can forcibly override the player character’s motor control through a modified brain chip, and a monologue system that delivers the player character’s narration and cognitive deterioration in real time. Together, these systems situate the game within a specific lineage of endurance entertainment, from the dance marathons of the 1930s to contemporary streaming culture, in which the boundary between performer and victim has always been deliberately blurred.

This study was not designed to confirm a predetermined hypothesis about the value of restriction, but to map which specific design elements most strongly influenced engagement and perceived involvement within a heavily constrained horror context.

1.1 Problem Formulation

This thesis investigates how a confined, linear corridor-based level can be designed to sustain player engagement, involvement, and immersion in a horror game context despite deliberately restricted agency. Drawing on theories of player agency, immersion, and spatial restriction, we develop a playable prototype mostly inspired by found-footage horror films and games. The prototype is evaluated through playtests, combining player feedback, observation, and critical reflection on both the design process and the theoretical framework.

1.1.1 Research Questions

How do specific design elements in a confined, linear corridor-style level influence players engagement and perceived involvement when their agency is deliberately restricted?

Sub-question 1: *To what extent does playing a confined, linear corridor-style level lead to player engagement (cognitive, emotional, behavioural) despite low agency?*

Sub-question 2: *How are players reported involvement levels across the PIM dimensions (narrative, spatial, kinesthetic, ludic, affective, shared) related to their overall engagement in a confined, linear level?*

Sub-question 3: *How do individual corridor design elements (level layout, walk style, narrative/choice UI, gamification feedback, and sound) contribute to players engagement and perceived involvement in this constrained space?*

Sub-question 4: *Which design elements most effectively compensate for the lack of meaningful choice, according to players self-reports and observed behaviour?*

2 State of the Art

In order to inform the development of the artifact, it was necessary to examine existing media that explores similar aesthetic, spatial and experiential qualities. This includes works from film, games and related horror media, with particular focus on the found footage genre and its use of constrained perspective, environmental tension and restricted agency. Through analysing both cinematographic and ludographic references, this Section identifies design approaches relevant to the thesis’ investigation of confined and linear spaces within horror experiences.

2.1 Cinematography

Cinematography plays a significant role in horror media as it shapes how audiences perceive space, movement, tension, and vulnerability. Through framing, lighting, camera movement, perspective, and pacing, films are able to guide attention and influence emotional interpretation of environments (Bordwell and Thompson, 2013, p. 159–215). Within horror cinema, these techniques are frequently used to create anticipation and discomfort by restricting visual clarity and spatial awareness.

This becomes particularly relevant within confined and linear environments such as corridors, stairwells, tunnels, and narrow interior spaces. Such environments naturally constrain movement and perspective, allowing cinematography to direct focus whilst simultaneously obscuring information outside the visible frame. Restricted visibility and spatial limitation encourage the audience to anticipate threats beyond their immediate perception, creating tension through uncertainty and lack of control.

The found-footage genre further reinforces these qualities through the use of diegetic cameras, where the camera exists within the fictional world itself. Unlike traditional cinematic presentation, found-footage horror often imitates amateur recordings through unstable camera movement, imperfect framing, low visual fidelity and limited viewpoints. Heller-Nicholas argues that found footage horror creates an “appearance of reality” by presenting fictional events through documentary-style aesthetics and amateur media conventions associated with consumer recording technologies (Heller-Nicholas, 2014, pp. 16–18). This approach is particularly relevant to the thesis project, as the intended artifact similarly seeks to create immersion through constrained perspective and limited environmental readability.

These cinematic principles are relevant to this thesis because they demonstrate how spatial restriction and controlled perception may contribute positively to immersion rather than diminishing it. By examining how horror films utilise constrained perspectives, environmental pacing, and limited visibility, we can explore how similar techniques may be translated into interactive level design. This is especially important within the context of linear corridor-based

spaces, where player movement and environmental readability become central to the experience of agency, immersion, and tension.

2.2 Movie Inspirations

The following are the movies we took interest in and did analysis on. We handpicked these based on their summary and their relation to the thesis and topic at hand. Spoilers ahead!

2.2.1 Deadstream



Figure 1: Deadstream movie poster

“Deadstream”, [2022](#) is an American horror-comedy set in a haunted house known as Death Manor. The film follows Shawn, a YouTuber and the story’s protagonist, who attempts to revive his career following a public controversy that cost him a significant portion of his audience and his sponsorships. In a desperate bid to recover, he livestreams himself spending 24 hours alone in Death Manor. Under the terms of his sponsorship agreement, he is prohibited from leaving and must explore the house in its entirety, or risk forfeiting the deal.

Throughout the film, the audience experiences Shawn’s livestream through head-mounted camera, tripods, and handheld cameras. As he explores the house, he presents its history to his viewers in the style of an online livestream. What initially appears to be a typical broadcast gradually turns into a supernatural disaster when Shawn accidentally destroys a sigil hidden within his “safe room”. Following this incident, a series of disturbing supernatural events unfolds, exposing both the dangers of the house and Shawn’s growing vulnerability.



((a)) Shawn interacting with the stream



((b)) Environmental camera feed

Figure 2: Movie stills from “Deadstream”, 2022

What we found particularly interesting in this film is how Shawn attempts to entertain his audience through house lore, challenges, and exploration, an aspect that is less prominent in the other films discussed later, with the exception of *Gonjiam: Haunted Asylum*. Similar to many found-footage horror films, *Deadstream* utilises three primary camera states: head-mounted cameras, handheld cameras, and tripods. Each perspective creates a different impression throughout the film. The head-mounted camera is primarily used during intense situations to immerse the audience directly in the action, the handheld camera is often used for interaction and entertainment, whilst the tripod shots provide a more omniscient view of the environment.

2.2.2 Gonjiam: Haunted Asylum



Figure 3: Gonjiam: Haunted Asylum movie poster

“Gonjiam: Haunted Asylum”, 2018 is a South Korean found-footage horror film released in 2018, set in a real abandoned psychiatric hospital of the same name, where a YouTube channel called *Horror Times*, run by Ha-joon, assembles a team of six volunteers to explore the asylum and uncover the secrets surrounding one of Korea’s most infamous haunted locations. (Kim, 2018)

At first, the exploration is structured as a controlled and performative livestream, where the team sets up cameras throughout the building, conducts staged challenges, and attempts to generate suspense for their online audience. However, as they progress deeper into the asylum, the situation gradually shifts from entertainment to survival, as increasingly disturbing and unexplained

phenomena begin to occur. The production setup begins to break down, and the characters lose both orientation and control within the building.

Similar to other found-footage horror films, *Gonjiam: Haunted Asylum* relies on “handheld” and mounted camera perspectives to construct a sense of immediacy and spatial disorientation. As the group moves through narrow corridors and repetitive interior spaces, the footage reinforces themes of confinement, panic, and loss of agency, where the environment itself becomes increasingly hostile and difficult to navigate.

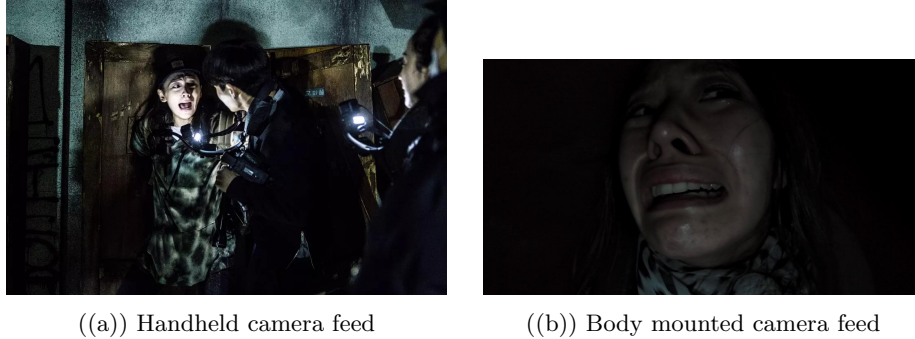


Figure 4: Movie stills from “Gonjiam: Haunted Asylum”, 2018

Throughout the film, several cinematographic aspects stood out as particularly interesting, particularly the use of lighting and shadow. The combination of face-mounted lighting and handheld flashlights creates multiple dynamic light sources, producing deep, shifting shadows that often suggest movement even when none is present, reinforcing uncertainty within the space.

The face-directed lighting, combined with head-mounted camera perspectives, also allows for clearer visibility of character expressions during moments of tension. In addition, the camera is positioned slightly outside the characters’ direct field of view, giving the footage a more controlled and technologically mediated feel.

Compared to earlier found-footage films, *Gonjiam: Haunted Asylum* presents a more modern and technologically refined approach. The use of green night vision establishes a distinctive aesthetic that enhances dread and is reminiscent of horror games such as *Outlast* (Red Barrels, 2013). Occasional camera static further contributes to immersion by simulating signal interference, reinforcing the illusion of realism.

Overall, the film is effective in its sustained tension building, maintaining prolonged suspense without frequent release points. This creates a constant state of anticipation, where the timing of horror events remains unpredictable.

2.2.3 “They Shoot Horses, Don’t They?”

“They Shoot Horses, Don’t They?”, 1969 is an American drama film set during the Great Depression era of 1930s America. The film follows a group

of desperate contestants competing in a brutal dance marathon, an endurance contest where couples dance continuously for days or weeks in hopes of winning a cash prize. As the competition drags on, the contestants are pushed to their physical and psychological breaking points whilst an audience watches, cheers, and consumes their suffering as spectacle.



Figure 5: "They Shoot Horses, Don't They?" movie poster

What drew us to this film was not its horror aesthetics but what it reveals about the structural relationship between human suffering and entertainment. The dance marathon does not merely tolerate exhaustion and desperation; it requires them. The spectators are not passive witnesses to an unfortunate byproduct of the competition; they are the reason the competition continues. The suffering is the entertainment. This observation helped solidify one of the central thematic pillars of *Haunted Hollow*.

What the film makes visible is a pattern that did not originate in the 1930s and did not end there. The impulse to watch others endure has persisted across history, finding successive containers that are socially acceptable enough to obscure the underlying structure. Gladiatorial combat and public executions are easy to condemn from a contemporary vantage point. Dance marathons are more uncomfortable, because the line between voluntarism and coercion is blurred; contestants chose to enter, but the conditions that made participation feel necessary were not of their choosing.

This same ambiguity characterises the entertainment formats that followed. Reality television formalised the structure: programmes like *Fear Factor*, which asked contestants to endure physical disgust and fear, or *America’s Next Top Model*, where psychological pressure and public humiliation were packaged as aspirational drama, with audiences invited to enjoy the spectacle under the cover of rooting for a winner. The distance between viewer and subject was maintained just enough to make consumption feel innocent.



Figure 6: Movie stills from “They Shoot Horses, Don’t They?”, 1969

The early internet produced its own variants of this structure, some mundane and some considerably darker. Practices such as capping, the covert recording of minors on streaming platforms for exploitation or sextortion (Government of Canada, Public Safety Canada, 2023), represented an early and largely unacknowledged dark current running beneath the more visible entertainment formats of the period. More publicly, viral challenge formats such as the Cinnamon Challenge and the Ice Bucket Challenge, alongside countless YouTube formats built around watching individuals suffer, fail, or be frightened, demonstrated how readily audiences would organise around the spectacle of someone else’s discomfort, even when framed as participation or solidarity.

Livestreaming collapses that distance almost entirely. The format places a single person in a situation in real time, with an audience that watches, reacts, and, crucially, participates. Through donations and chat interactions, the audience does not merely observe the performer’s experience; it actively shapes it. The boundary between watching someone endure and causing them to endure becomes, in this format, structurally impossible to locate.

2.2.4 [REC]

“[REC]”, 2007 is a Spanish found-footage horror film released in 2007. The plot follows a television reporter and her cameraman as they film a documentary about the local firefighters and their night shift. After receiving a call regarding an elderly woman trapped inside her apartment, the firefighters respond to the scene, only to gradually realise that something terrifying is unfolding within the building.



Figure 7: [REC] movie poster

What initially appears to be a relatively ordinary documentation of emergency responders quickly escalates after the crew enters the apartment building. As the residents begin displaying violent and abnormal behaviour, panic spreads throughout the confined environment. The authorities eventually seal off the building, trapping everyone inside and forcing the reporter and cameraman to continue documenting the unfolding events.

Similar to many found-footage horror films, *REC* relies heavily on handheld camera perspectives to create immediacy and realism. The narrow hallways, stairwells and apartments contribute to a strong sense of confinement, whilst the limited visibility and chaotic camera movement intensify feelings of tension and disorientation. As the situation worsens, the camera becomes both a narrative device and a source of immersion, placing the audience directly within the escalating horror.

One aspect we found particularly interesting in *REC* is how the film balances periods of calm documentation with sudden chaotic escalation. The interview and documentary segments at the beginning interrupt the flow of action in a deliberate way, making the later horror sequences feel more grounded and be-

lievable. This slower introduction contributes significantly to the realism of the film, as the events initially resemble an ordinary emergency response rather than a traditional horror setup.



((a)) Movie still



((b)) Movie still

Figure 8: Movie stills from “[REC]”, 2007

The chaotic nature commonly associated with found-footage horror is also presented effectively throughout the film. The unstable handheld camera work, abrupt movements, and incomplete visual information create the impression that the footage could plausibly have been recovered from a real event. Rather than feeling heavily staged, the cinematography maintains a raw and unpolished quality that strengthens immersion and tension.

In addition, the film combines elements of infection-based or “zombie-like” horror with religious themes introduced later in the narrative. This shift expands the horror beyond physical violence and introduces a more unsettling atmosphere surrounding the origins of the outbreak, contributing to the film’s overall sense of dread and uncertainty.

2.2.5 The Descent



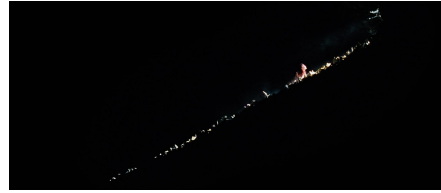
Figure 9: The Descent movie poster

“The Descent”, 2005 is a British horror film released in 2005. The story follows a group of six thrill-seeking women who embark on a cave exploration expedition that quickly turns into a nightmare when they become trapped underground and pursued by hostile humanoid creatures.

The film centres around Sarah, who is still recovering from a tragic accident that resulted in the deaths of her husband and daughter. A year later, her friend Juno organises a cave exploration trip together with four other women as a way to reconnect and seek adventure. However, what initially appears to be a routine expedition gradually develops into a desperate struggle for survival when the group discovers that Juno has intentionally led them into an unexplored cave system. With limited supplies, collapsing passageways and little knowledge of the cave’s layout, the group must navigate the confined environment whilst being hunted by unknown creatures lurking within the darkness.



((a)) Movie still



((b)) Movie still

Figure 10: Movie stills from “The Descent”, 2005

A particularly compelling element of *The Descent* is its strong use of colour and lighting to reinforce emotion and character relationships e.g., ???. The film frequently associates characters with distinct colours, such as Juno being connected to green tones and Sarah to red, subtly reflecting themes of jealousy, guilt and anger throughout the narrative. Combined with the strong contrast between darkness and artificial light sources, this creates a visually striking and oppressive atmosphere.

The lighting design is especially effective due to its reliance on believable in-world light sources, including torches, flares, glowsticks, headlamps and flashlights. Since the cave environment is naturally devoid of light, these sources become essential for visibility whilst simultaneously limiting perception and increasing tension. The film also makes extensive use of close-up camera work, emphasising the characters’ emotional reactions and reinforcing the claustrophobic nature of the cave system.

Although the film contains significant gore and action-focused horror, which is not something we necessarily aim to replicate, the physical brutality of the encounters contributes strongly to the audience’s sense of danger and discomfort. In addition, the characters themselves are well differentiated and developed, making interpersonal conflict and group tension an important part of the experience. The narrative also presents an interesting chain of cause and effect, where Sarah’s personal tragedy becomes a major reason for the expedition taking place in the first place.

The humanoid cave creatures were also particularly memorable due to their design and behaviour. Rather than functioning as traditional monsters, they resemble an evolved cave-dwelling species that navigates similarly to bats through sound and darkness. Their design evokes creatures such as the Falmer from *The Elder Scrolls V: Skyrim*, contributing to a grounded yet unsettling interpretation of subterranean horror.

2.2.6 Grave Encounters



Figure 11: Grave Encounters movie poster

“Grave Encounters”, [2011](#) is a Canadian found-footage horror film released in 2011. The film follows the crew of a paranormal reality television show called *Grave Encounters*, led by host Lance Preston, as they investigate an abandoned psychiatric hospital rumoured to be haunted. Initially treating the investigation as staged entertainment for television, the crew soon discovers that the hospital contains genuine supernatural activity.

What begins as a routine overnight recording inside the asylum gradually develops into a desperate attempt to escape as the building itself appears to change and distort around the crew. Corridors shift, exits disappear, and the team becomes increasingly disoriented as they experience disturbing paranormal events throughout the hospital. As panic spreads amongst the crew members, the boundary between reality and hallucination becomes increasingly unclear.

A particularly effective aspect of *Grave Encounters* is how the hospital itself functions as an active source of horror rather than simply serving as a backdrop. The constantly shifting corridors and impossible spatial layouts create a strong sense of entrapment and disorientation, making the environment feel unpredictable and hostile. Combined with the use of night vision, handheld cameras, and extended periods of darkness, the film creates a persistent feeling of uncertainty where both the characters and the audience gradually lose their understanding of the space around them.

One of the more distinctive elements of *Grave Encounters* is its manipulation of the camera lens itself as part of the horror experience. Elements such as blood

splatter, dirt, and characters physically cleaning the lens reinforce the illusion that the footage is being recorded in real time. In some cases, even the act of cleaning the camera becomes a source of tension or a setup for scare events, making the recording equipment feel physically present within the environment.



((a)) Movie still



((b)) Movie still

Figure 12: Movie stills from “Grave Encounters”, [2011](#)

The film also strongly prioritises the found-footage perspective by restricting information entirely to what is visible through the cameras. When characters disappear or events occur outside the frame, neither the audience nor the remaining crew fully understands what has happened unless it is directly documented. This limitation of perspective contributes significantly to immersion and uncertainty, as the viewer experiences the events with the same lack of information as the characters themselves.

The tension building throughout the film is particularly effective due to the constant movement of the cameras. Since the footage rarely remains still, scare events are often hidden naturally within the chaotic framing, making them feel sudden and unpredictable rather than heavily staged. Compared to *Gonjiam: Haunted Asylum*, the tension structure in *Grave Encounters* follows a different pacing style. Whilst *Gonjiam* builds tension in escalating “steps” with clear peaks, *Grave Encounters* instead creates a more wave-like rhythm, alternating between quieter moments and sudden bursts of horror.

The motivations of the main characters also differ significantly between the two films. In *Grave Encounters*, Lance Preston gradually shifts his priorities from producing entertaining content to protecting the crew as the situation worsens. In contrast, the leadership in *Gonjiam: Haunted Asylum* remains strongly focused on content creation and viewership despite the increasing danger. Towards the end of *Grave Encounters*, Lance’s attitude towards both the audience and the act of filming becomes increasingly hostile and frustrated, as though the continuous recording itself has become part of the nightmare. This progression presents an interesting narrative direction that could potentially inspire character development within our own project.

2.2.7 Summary & Takeaways

To summarise, even though found-footage films nowadays can often be perceived as more “make-believe” (Heller-Nicholas, 2014, pp. 16–18), the genre is still capable of capturing the audience’s attention through its immersive presentation and perspective-driven storytelling.

What we gathered from watching these films is that, although most of them belong to the found-footage genre, they are presented in various ways whilst still sharing several similarities. One aspect that particularly inspired us is how many of the films create a strong sense of confinement within the spaces they portray. As an audience, you are unable to freely observe the environment unless the camera deliberately directs your attention towards it. This feeling of restriction and claustrophobia creates a more intense experience and, if implemented within a game, could similarly restrict player agency and freedom of movement.

One inspiration we want to take from *Deadstream* is its presentation of a more modernised version of found-footage horror through the use of livestreaming culture. We want our artifact to feel as though the player is actively being the livestreamer exploring a haunted location rather than a viewer.

Gonjiam: Haunted Asylum demonstrates particularly strong use of lighting and shadows, which is something we would like to experiment with in our own project. We want to make use of dynamic lighting events and shadows that appear to defy common sense. Another aspect we draw inspiration from is the film’s tension building. We aim to sustain tension for extended periods so that players remain in a constant state of anticipation whilst exploring the environment.

We also want to create interesting cave systems inspired by *The Descent*. These environments should either be highly linear and claustrophobic or contain smaller branching paths that make the player feel uneasy whilst navigating the space. The visual presentation in *The Descent* is also inspiring, particularly its use of colour symbolism and lighting to reinforce emotion and atmosphere within dark environments such as caves.

Additionally, we want to experiment with warped and disorienting spaces inspired by *Grave Encounters*. The film effectively demonstrates the confusion and terror caused by becoming trapped within an environment that continuously changes and distorts. We aim to create a similar feeling by manipulating the player’s understanding of the environment and movement through restricted navigation, confined spaces, and limited visibility.

They Shoot Horses, Don’t They? occupies a distinct position among the film references we examined. Unlike the found-footage works discussed previously in this Section, it contributes neither aesthetic nor cinematographic inspiration but rather a structural and thematic one. What the film makes visible is the

underlying logic of endurance entertainment: that an audience’s appetite for a performer’s suffering does not diminish as that suffering becomes more genuine, but intensifies. This observation became central to how *Haunted Hollow* frames the relationship between the player character and their live audience. The dance marathon structure, in which spectators are not passive witnesses but the reason the performance continues, directly informed the design of the donation and chat systems as mechanisms through which the audience exerts escalating pressure on the performer. Rather than borrowing the film’s visual language, we borrowed its argument: that the boundary between performer and victim within entertainment formats has always been deliberately blurred, and that the livestreaming context of our artifact represents the most recent and mechanically direct iteration of that structure.

2.3 Game Inspiration

Whilst the films primarily utilise cinematic techniques to create tension, immersion and confinement, many of the observed design principles are also highly relevant within interactive media. Several of the elements discussed, such as restricted perspective, environmental disorientation, controlled visibility, and sustained tension, can be translated into gameplay and level design. In the following Section, we therefore examine how horror games utilise similar techniques to influence player agency, navigation, and immersion within interactive spaces.

2.3.1 Outlast

Outlast, developed by Red Barrels, 2013, is a first-person survival horror game in which the player takes control of investigative journalist Miles Upshur. After receiving an anonymous tip, he infiltrates Mount Massive Asylum in order to uncover the truth behind illegal experiments taking place within the facility. Relying only on a handheld camcorder with limited night vision, Miles must navigate the dark corridors of the asylum whilst avoiding hostile inhabitants and documenting the unfolding events.

As the investigation progresses, it becomes increasingly clear that the asylum has descended into chaos following unethical experiments conducted on patients, resulting in violent and unstable subjects roaming the facility. With no means of combat, the player is forced to rely entirely on stealth and evasion, which reinforces a constant sense of vulnerability and tension. The camcorder becomes both a narrative device and a core gameplay mechanic, as its limited battery life and night vision function shape how the environment can be perceived. Ultimately, the game maintains a persistent feeling of helplessness and confinement, as Miles is gradually drawn deeper into the asylum’s collapsing internal systems and escalating horrors.

One of the key aspects we found particularly interesting in *Outlast* is how it adopts a found-footage-like presentation within an interactive medium. The

game features a diegetic camcorder with night vision as a central framing device, shaping how the player perceives and navigates the environment. Although the camcorder is not strictly required for all gameplay situations, it is heavily encouraged and often essential for visibility in dark spaces, making it a dominant lens through which the experience is structured.



Figure 13: Outlast coverart



((a)) Camcorder

((b)) Game still

Figure 14: Game stills from Outlast Red Barrels, [2013](#)

Another notable element is the limitation of player agency throughout the game. The experience is largely restricted to movement, exploration and hiding, resulting in a tightly constrained interaction loop focused on stealth and survival. This reduction in available actions reinforces vulnerability and encourages a cautious, observational playstyle rather than direct engagement.

Finally, the tension design and pacing of chase sequences are particularly effective. The player is rarely given clear indication of when danger will occur, which creates a constant underlying sense of anticipation. This unpredictability ensures that even quiet moments remain tense, as the possibility of being pursued is always present.

2.3.2 Deadcam



Figure 15: Deadcam coverart

Deadcam, developed by Alien Big Cat, [2025](#), is a first-person psychological survival horror game. The game is set within a rural abandoned house where a group of amateur paranormal investigators are filming an episode of a failing ghost-hunting television show. As the situation escalates, one of the crew members, Margo, becomes increasingly unstable, and the events inside the house quickly turn hostile and unpredictable.

The player experiences the unfolding situation through a found-footage-inspired perspective, where a live, reactive head-mounted camera feed from Margo herself plays a central role in both storytelling and gameplay. As Margo patrols the house, this live feed can be used to infer her position and movements within the environment, allowing the player to anticipate encounters and avoid direct contact. However, the player must also navigate environmental hazards such as alarm traps, glass shards and noise-sensitive floor areas, which can reveal their location and attract Margo's attention. The primary objective is to search the house for useful items that aid in escape, or to potentially burn down the house as a means of ending the curse inflicted upon Margo.

An interesting design aspects of *Deadcam* is its use of a head-mounted camera that is not attached to the player, but instead belongs to the antagonist, Margo. This shifts the traditional found-footage perspective away from a player-centric viewpoint and instead positions the camera as an instrument controlled

by a hostile entity within the space. As a result, the camera becomes both a narrative and systemic tool, providing information about Margo’s state, movement and perception of the environment.



Figure 16: Game stills from Deadcam Alien Big Cat, 2025

Rather than functioning solely as a visual framing device for the player, the head-mounted feed introduces an additional layer of spatial awareness and tension. It creates an asymmetric information structure, where the player must interpret Margo’s perspective to anticipate danger, effectively turning the camera into a secondary navigation and threat-detection system. This inversion of the typical player-camera relationship adds a distinct dimension to the experience, as the act of “seeing” is partially mediated through the antagonist’s point of view.

2.3.3 Cave Crawler

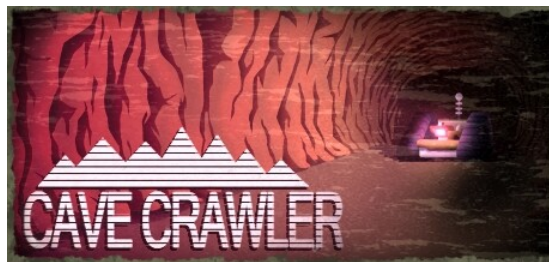


Figure 17: Cave crawler coverart

Cave Crawler, developed by Technomancy Studios, 2023, is a short first-person horror game in which the player operates a remotely controlled robot sent into an uncharted cave system to investigate a missing person. As the exploration progresses, it becomes clear that something unknown is present within the cavern network, turning a routine search operation into a tense and increasingly unsettling experience.

The game primarily focuses on environmental exploration through a confined

subterranean space, where the player uses the drone’s limited sensory input to scan, observe and navigate the cave system. Progression is structured linearly, with emphasis placed on atmosphere, spatial uncertainty and gradual discovery rather than direct confrontation. As the drone moves deeper into the cave, the environment becomes increasingly oppressive and difficult to interpret, reinforcing a sense of isolation and ambiguity regarding what is truly present within the darkness.

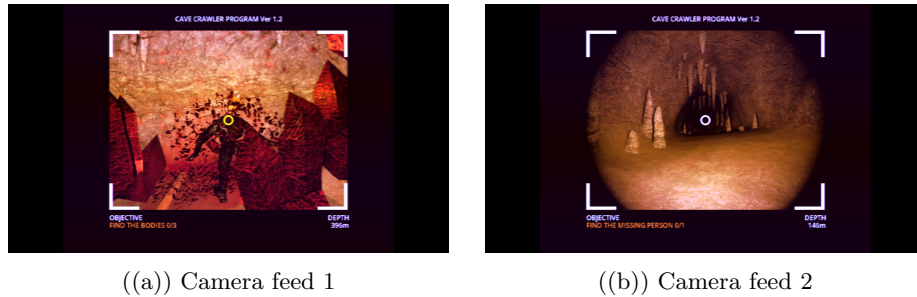


Figure 18: Game stills from the Cave crawler (Technomancy Studios, 2023)

A particularly interesting aspect of *Cave Crawler* is its use of cave exploration as a form of structured spatial uncertainty. The confined nature of cave systems inherently restricts visibility, movement, and orientation, which aligns closely with our interest in linear and claustrophobic space design. As a result, the environment itself becomes a primary source of tension, where narrow passages and repetitive formations make it difficult to maintain a clear sense of direction or progress.

The use of a remotely controlled drone further reinforces this sense of detachment and limited agency, while also introducing a found-footage-like mediated perspective. Rather than directly embodying the player within the space, the experience is filtered through a recording-style viewpoint, where perception is constrained by the device’s camera feed. This creates a dynamic where even small environmental changes feel significant, highlighting how restricted input and limited visual feedback can enhance immersion within confined exploratory spaces.

2.3.4 Summary & Takeaways

Across the analysed games, a consistent design pattern emerges in how perception, agency and spatial understanding are deliberately constrained to heighten tension and immersion.

In *Outlast*, the camcorder system frames the entire experience through a mediated lens, where visibility is limited by battery life, darkness and the reliance on night vision, reinforcing vulnerability and uncertainty.

In *Deadcam*, this idea is extended by shifting the camera away from the player and instead attaching it to an antagonistic agent, creating an asymmetrical information structure where the player must interpret hostile perception to survive.

Similarly, *Cave Crawler* demonstrates how mediated exploration through a remote drone can transform environmental navigation into an indirect, constrained reading of space, where even basic movement and orientation are filtered through limited sensory input.

What connects these examples is the consistent use of camera mediation and spatial restriction as core design strategies for horror. Whether through player-held devices, antagonist-controlled viewpoints, or remote-controlled exploration tools, each game demonstrates how limiting direct access to information can intensify immersion and psychological tension. This reinforces our overall research direction, suggesting that constrained perspectives and linear or semi-linear spatial structures can be used deliberately in our artifact to shape player agency, uncertainty, and engagement within confined horror environments.

In terms of inspiration for our own artifact, the three games offer complementary design directions that collectively inform how we approach confined horror spaces and mediated perception. From *Outlast*, we draw inspiration from the use of a diegetic camera system as a core framing device. This is further extended through the idea of integrating a live recording layer, inspired by *Deadstream*, where a continuous video feed and implied live audience (e.g. chat interaction) can reinforce the feeling of performance under observation while also shaping how information is presented to the player.

From *Deadcam*, we are particularly inspired by the combination of confined space design and the presence of an active antagonist within that same space, creating a constant spatial and psychological pressure on the player. This relationship between player movement and hostile awareness reinforces the importance of spatial control and surveillance within linear environments. Meanwhile, *Cave Crawler* provides inspiration for how navigation through cave systems can be structured, particularly in relation to disorientation and constrained traversal. We are also interested in the possibility of environmental transformation over time, where the cave layout may subtly or drastically change to disrupt player understanding of previously explored spaces.

3 Fundamental Theory

In this Section, we explore the theoretical foundations relevant to our investigation of confined and linear horror spaces, player agency, immersion, and tension within interactive media. The purpose of this Section is to establish an analytical framework that supports both the design of our artifact and the later evaluation of player experiences. Through theories related to player involvement, spatial design, horror, and mediated perception, we aim to better understand how restricted environments and limited agency can still produce engaging and immersive gameplay experiences.

3.1 Player Agency and Restriction

Player agency and restriction are essential topics to this thesis. By examining the concept of player agency and how the restriction of agency can influence player engagement and immersion, we can manipulate how players experience the *freedom* within games and more importantly within horror experiences. Though rather than viewing agency solely as player freedom, we investigate how controlled limitations may shape emotional response, tension and perceived involvement.

3.1.1 Defining Player Agency

To begin, what is *"Player agency?"*

Player Agency has been, and still is, a central topic within game studies. This concept is commonly associated with the player's ability to perform meaningful actions and observe the consequences of those actions within a game system. Instead of defining it simply as unrestricted freedom, agency is often understood as the perception that the player's actions matter within the designed structure of the experience.

One of the earlier definitions of player agency is presented by Janet Murray Murray, 2016 ver. ch. 5, where she describes agency within digital artifacts as

"... the satisfying power to take meaningful actions and see the results of our decisions and choices."

Murray's definition emphasises that agency is not necessarily dependent on interaction itself, but rather on the perceived meaning and system response behind the player's actions. One example she discusses is the game Chess, where players are given a large range of possible choices that determine the course of the game. The decision of how and when to act is left entirely to the players and their intentions behind each move, this can be interpreted as player agency (Murray, 2016 ver. ch. 5).

The feeling of agency is not necessarily defined by what the player *can* do, but rather by the perceived response and meaning attached to their actions within the system. Murray compares agency within digital environments to participation in folk art rituals, an example she mentions is within a wedding setting,

where participation (e.g. going on the dancing floor) may be forced and where the act of taking part does not necessarily create meaningful change (e.g. you cannot change how other people dance, you may influence your partner but that is the limit). In contrast, actions performed within digital environments often produce direct and visible feedback in response to player interaction. Murray exemplifies this by stating:

“... when the right file opens, when our spread-sheet formulas function correctly, or when the simulated frogs flourish in the model pond, it can feel as if the entire dance hall is at our command. When things are going right on the computer, we can be both the dancer and the caller of the dance.”

This, according to Murray, is what creates the feeling of agency within digital systems, where the user perceives their actions as meaningful due to the system’s acknowledgement and response (Murray, 2016 ver. ch. 5).

Lastly, in relevance to this thesis, Murray explains that one important form of agency within digital environments is spatial navigation and the act of exploration. She claims that *“... moving through space in an exploratory way ... is a satisfying activity regardless of whether the space is real or virtual”*, suggesting that movement and exploration are among the more fundamental forms of agency within digital environments, and particularly within games.

Murray further categorises exploratory structures into two forms: the single-path maze adventure and the rhizome. The maze adventure is defined as a navigational structure where progression through space is directly tied to the unfolding of the narrative. This creates a sense of agency through movement, where the player experiences satisfaction from traversing the environment and progressing the story. However, Murray also notes that this form of structure often restricts the player towards a singular solution or endpoint. Whilst the player may still experience agency through navigation, the limited range of possible outcomes may eventually create impatience or frustration, as players naturally seek alternative paths and methods of exploration (Murray, 2016 ver. ch. 5).

In contrast, Murray describes the rhizome as a more fragmented and non-hierarchical form of navigation, where exploration does not necessarily move towards a definitive ending or singular path. She describes the rhizome as follows:

“... As we navigate its tangled, anxiety-laden paths, enclosed within its shape-fitting borders, we are both the exasperated parent longing for closure and separation and the enthralled child, lingering forever in an unfolding process that is deeply comforting because it can never end.”

Rather than representing unrestricted freedom, the rhizome instead reflects a form of endless and interconnected exploration, where players continuously navigate branching possibilities without clear closure. Murray’s comparison high-

lights a tension between the desire for freedom of exploration and the simultaneous desire for direction and resolution. In relation to this thesis, this distinction becomes particularly relevant when examining confined and linear spaces, as it suggests that player involvement is not solely dependent on unrestricted movement, but also on how navigation, uncertainty, and progression are structured within the environment (Murray, 2016 ver. ch. 5).

Whilst Murray focuses on the player’s perception of meaningful actions and how one of the more fundamental forms of agency emerges through exploration, Jesper Juul instead provides an influential framework for understanding games through the relationship between rules and fiction. In his book *Half-Real*, Juul argues that games consist of both real rule systems and fictional worlds, where player actions gain meaning through the interaction between these two layers (Juul, 2005). Broadly speaking, his theory describes games as the intersection between formal systems and fictional experiences, as well as the relationship between the game, the player, and the world. The structure of a game is therefore formed through formal rule systems whilst simultaneously presenting fictional worlds that contextualise player actions (Juul, 2005).

Based on this, we can draw the connection that agency within video games emerges through the player’s interaction with these systems. Actions become meaningful because they are recognised and responded to by both the game’s mechanics and its fictional framing, whilst whether these actions are ultimately perceived as meaningful depends on the player’s own interpretation.

Following Jesper Juul and his theory on the relationship between rules and fiction within video games, Mateas and Stern, 2005 in their paper *Interaction and Narrative* talks about how the player experiences agency when there is a balance of material constraint¹ and formal constraint².

“A player will experience agency when there is a balance between the material and formal constraints.”

This balance is not solely structural, but also relates to how player actions are framed and perceived within the game as meaningful. In this sense, agency emerges not only from the presence of constraints themselves, but from how coherently these constraints support the player’s understanding of their actions within the game world.

Maintaining a balance between formal and material constraints is important for supporting a strong sense of agency within games. Mateas and Stern argue that many puzzle-oriented games struggle to maintain this balance, resulting in a weakened sense of player agency. They use *Zork Grand Inquisitor* (Activision, 1997) as an example, describing how it presents a rich and expansive fictional

¹**Material Constraint** comes from the limitation of implementation and/or medium, they refer to something like technical restrictions and interface limitations (e.g. limited camera control).

²**Formal Constraint** comes from the rule system of the game, they define what actions are allowed and what outcomes are possible (e.g. you cannot walk through locked doors).

world; however, the actions available to the player often feel disconnected from the overall progression of the game. As a result, players may perceive their actions as having limited impact on the game’s goals, which reduces the feeling that their choices meaningfully contribute to progression and disrupts the overall sense of dramatic coherence.

In contrast, they highlight *Quake* (id Software, 1996) as an example of a game that more successfully aligns formal and material constraints. In *Quake*, the player’s available actions, movement possibilities, and system responses are closely aligned with the game’s core objectives, creating a consistent and immediate relationship between player input and in-game consequences. This tight coupling between action and feedback strengthens the sense that player actions matter within the game world, thereby supporting a stronger experience of agency through clear and readable cause-and-effect relationships.

In summary, player agency can be understood as the player’s perceived ability to perform meaningful actions and influence outcomes within a designed system, rather than as unrestricted freedom. Building on Murray’s definition, agency emerges through the player’s sense that their actions matter, supported by clear system responses and meaningful feedback. This includes spatial navigation as a fundamental form of agency, where Murray distinguishes between different experiential structures of movement. The maze structure represents a more directed form of progression, where navigation tends to follow a clearer path or sequence of actions, whereas the rhizome describes a more open and interconnected form of exploration where movement can branch extensively and feel potentially endless. While Jesper Juul extends this understanding by framing games as a combination of formal rule systems and fictional worlds, Mateas and Stern further emphasise that agency depends on the alignment between formal and material constraints, ensuring that player actions are both systemically coherent and meaningfully acknowledged within the game world.

Across these perspectives, player agency can therefore be understood less as unrestricted freedom and more as a negotiated relationship between player action, system structure, and perceived meaning. This perspective highlights that agency emerges through how actions are framed, processed, and responded to within designed systems, rather than through the amount of freedom available to the player.

3.1.2 Restriction, Meaningful Choice and Horror

Within horror games, restriction is often used deliberately as a design strategy to increase tension, uncertainty, and emotional involvement. Unlike genres that focus on empowerment and player freedom, horror experiences frequently reduce the player’s sense of control through limited information, restricted movement, constrained resources, or vulnerability towards threats.

According to Xing Chen in *Exploring the Pathways to Immersion in Horror Games*, immersion in horror games is strongly supported through the use of

environmental design, sensory manipulation, and emotional engagement, which together create a sustained sense of fear and anticipation (Chen, 2025). Rather than reducing engagement, these restrictions instead increase attentiveness and emotional investment by placing the player in a continuous state of uncertainty.

In relation to agency, meaningful choice within horror games does not necessarily emerge from offering the player a large quantity of actions or branching outcomes. Instead, the perception that actions carry consequence and tension can itself support player involvement. Xing Chen highlights that immersion in horror games is closely linked to sustained attention and emotional engagement, where players become highly responsive to environmental cues such as sound, lighting, and spatial composition (Chen, 2025). Even when the player is placed within heavily constrained situations, the constant need to interpret danger, navigate uncertainty, and react to environmental stimuli can maintain a strong sense of engagement. This suggests that agency within horror games may be less dependent on unrestricted freedom and more dependent on how the game frames player interaction and perceived consequence.

From this perspective, restriction within horror games does not necessarily function as the removal of agency, but rather as a restructuring of how agency is experienced by the player. By limiting information, movement, or available actions, horror games intensify the player’s attention towards environmental cues, uncertainty, and anticipation. Chen emphasises that immersion in horror games is shaped by the careful use of pacing, atmosphere, and sensory design, where tension is maintained through the interplay between expectation and uncertainty (Chen, 2025). Meaningful involvement can therefore still emerge within constrained situations, as emotional engagement and attentiveness often become more significant than the quantity of available choices.

3.2 Player Engagement

Engagement is commonly understood within game studies as a multidimensional process that emerges through the interaction between the player, the game system, and the surrounding environment. Rather than describing a single psychological state, engagement instead encompasses multiple forms of involvement, including cognitive, emotional, and behavioural participation during gameplay. Rashed et al., 2025 address the multidimensional nature of engagement through a taxonomy of interrelated constructs, including motivation, immersion, flow, involvement, and endurability, each contributing distinct cognitive, affective, and behavioural dimensions to the overall engagement process. Zhang, 2024 similarly operationalises engagement across four dimensions within virtual environments: sensory involvement, emotional engagement, cognitive engagement, and flow. However, both works approach engagement from relatively contextualised perspectives, with Rashed et al., 2025 focusing on measurement and synthesis across existing literature, and Zhang, 2024 focusing on VR-based experiential analysis. This makes it difficult to isolate which individual factors are most responsible for sustaining player involvement in specific gameplay situations such

as confined horror experiences. Despite this limitation, both contributions remain useful for understanding engagement as a dynamic relationship between player attention, interaction, perception, and environmental structure.

A central aspect shared across these perspectives is the relationship between engagement and immersion. Rashed et al., 2025 describe immersion as a psychological state in which players become deeply attentive to the game environment while external distractions are reduced. The review further distinguishes between different forms of immersion, drawing on Ermi and Mäyrä, 2005 and their categorisation of sensory immersion through audiovisual presentation, challenge-based immersion through gameplay difficulty, and imaginative immersion through narrative and role-playing involvement. Similarly, Zhang, 2024 argues that immersive virtual environments can strengthen engagement by increasing the player’s sense of presence, understood as the subjective feeling of “being there” within a virtual space, and that both immersion and presence contribute to a broader sense of environmental envelopment that underpins player involvement. Whilst these discussions are valuable for understanding how immersion contributes to engagement, both works primarily conceptualise immersion in broad experiential terms rather than in relation to highly constrained or deliberately restrictive gameplay structures. Nevertheless, their perspectives remain relevant to this thesis, particularly in relation to how environmental perception, attentiveness, and sensory pressure may intensify player involvement within confined horror experiences.

Both works also emphasise the importance of cognitive engagement during play. Zhang, 2024 defines cognitive engagement as the intellectual effort players exert when attempting to understand and interact with the systems and tasks presented by the experience, involving processes such as problem-solving and self-regulated responses to task demands. Likewise, Rashed et al., 2025 link engagement to focused attention and cognitive absorption, particularly through the concept of flow, where player skill and challenge are balanced to sustain concentration and motivation, and through involvement, which is framed as a motivational dimension encompassing directed cognitive and behavioural investment in gameplay. However, these models are largely discussed in contexts that assume either active task-solving or continuous interaction with game systems, which may not fully align with slower-paced or intentionally restricted gameplay experiences. Even so, they remain useful for this thesis, as they suggest that sustained engagement can emerge through attentiveness, interpretation, and environmental interaction rather than through mechanical complexity alone.

Engagement is further shown to be shaped by environmental and structural design choices. Zhang, 2024 demonstrates that situational stressors within virtual environments can increase cognitive engagement and perceived cognitive effort, although this does not necessarily translate into improved performance or overall engagement outcomes. Meanwhile, Rashed et al., 2025 present engagement as a progressive and cumulative process in which motivation initiates engagement, immersion deepens it, flow optimises it, and endurability supports long-term return behaviour. One limitation, however, is that neither work di-

rectly addresses how extreme restriction of agency or highly linear spatial structures influence engagement over extended periods of play. Despite this, both contributions still support the broader argument of this thesis: that engagement is not solely dependent on player freedom or mechanical abundance, but can also emerge through carefully structured constraints, uncertainty, environmental pressure, and controlled forms of interaction.

Taken together, these perspectives frame engagement as a dynamic and multidimensional process shaped through the relationship between players, systems, and environments. Emotional involvement, cognitive investment, immersion, challenge, and environmental structure all contribute to how deeply players become engaged with an experience. Although neither work specifically examines confined corridor horror or heavily restricted agency in isolation, both provide useful theoretical foundations for understanding how engagement may still emerge within constrained and carefully controlled gameplay experiences.

3.3 Player Involvement and Immersion

Following Player Engagement and Player Agency Restriction comes Player Involvement and Immersion. During this Section we focus on how player involvement and immersion can be understood through theoretical frameworks related to interaction, emotion and spatial engagement. We aim to identify which forms of involvement are most relevant within confined horror experiences and how these may compensate for reduced player agency.

3.3.1 Immersion and Horror Engagement

Immersion has long been a central concept within game studies and digital media theory, describing the sensation of being absorbed into a virtual environment. Janet Murray defines it as being "transported" into another reality, where the participant becomes deeply engaged with the represented world (Murray, 2016 ver. ch. 4).

"The experience of being transported to an elaborately simulated place is pleasurable in itself, regardless of the fantasy content."

Rather than referring solely to graphical realism or technological fidelity, immersion instead describes the sensation of being surrounded by and absorbed into a digital environment that captures the participant's attention and perception (Murray, 2016 ver. ch. 4).

According to Murray, immersion emerges through participation and interaction with the digital environment. The participant is not simply observing events unfold, but actively navigating, interpreting, and engaging with the virtual space. This participatory characteristic of digital environments allows immersion to emerge through the player's ongoing involvement with the world and its systems, rather than through passive observation alone (Murray, 2016 ver. ch. 4).

Within horror games, immersion is often shaped through emotional and sensory engagement rather than empowerment or mastery. Xing Chen in *Exploring the Pathways to Immersion in Horror Games* explains that horror immersion is strongly influenced by atmosphere, audiovisual design, environmental ambiguity, and sustained emotional tension (Chen, 2025). Through sound design, lighting, spatial composition, and threat anticipation, horror games encourage players to maintain heightened attentiveness towards their surroundings and potential danger.

Chen further describes how horror engagement emerges through the player’s continuous emotional and psychological involvement during play. Feelings such as fear, anxiety, suspense, and anticipation become central to maintaining immersion, as players constantly interpret environmental cues and evaluate possible threats (Chen, 2025). In this sense, horror immersion is not solely dependent on narrative progression or visual realism, but also on the player’s sustained attentiveness towards uncertainty and environmental tension. The pacing of suspense and the manipulation of sensory information therefore become important tools for maintaining immersion within horror experiences.

In this sense, immersion within horror games can be understood as a state of sustained emotional and perceptual involvement, where players remain continuously attentive to the surrounding environment and its potential threats. Horror engagement is therefore maintained not through empowerment alone, but through anticipation, sensory attention, atmosphere, and emotional uncertainty, all of which contribute to sustaining the player’s absorption within the experience.

3.3.2 Calleja’s Player Involvement Model

Although immersion has become a widely used concept within game studies, Gordon Calleja argues that the term alone is often insufficient for explaining the different forms of player experience and engagement that occur during gameplay. In *In-Game: From Immersion to Incorporation*, Calleja instead proposes a structured framework of player involvement, which breaks down gameplay engagement into multiple dimensions that together contribute to the player’s overall experience. Rather than understanding immersion as a singular state of being “lost” within a game, Calleja reframes it as a continuous process of involvement that may, through sustained integration of its components, give rise to what he describes as incorporation (Calleja, 2007a, 2007b, 2011).

Calleja’s model distinguishes two temporal scales (Calleja, 2007a, 2007b, 2011):

- **Micro-involvement:**
Moment-to-moment engagement during play, including immediate decision-making, motor control, reactions to events, and situated attentiveness to the game environment.

- **Macro-involvement:**

Longer-term engagement that extends across play sessions, including anticipation, reflection, strategic planning, narrative expectation, and engagement with game-related communities or goals.

Both scales interact continuously: long-term investment in the game (e.g., commitment to goals, progression, or social structures) can shape and intensify moment-to-moment engagement during play, and vice versa (Calleja, 2007b, 2011; Calleja et al., 2016; Herrewijn et al., 2013).

Calleja identifies six experiential dimensions that can be active at both micro and macro levels (Calleja, 2007a, 2007b, 2011, 2013; Calleja et al., 2016; Herrewijn et al., 2013):

Dimension	Core idea	Citations
Kinesthetic	Moment-to-moment bodily control of the avatar, including movement, input mastery, and sensorimotor responsiveness	Calleja, 2007a, 2007b, 2011; Calleja et al., 2016; Herrewijn et al., 2013
Spatial	Cognitive and perceptual engagement with game space as a navigable and learnable environment, including orientation and spatial awareness	Calleja, 2007a, 2007b, 2011, 2013
Shared	Awareness of and interaction with other agents in the game world, including multiplayer co-presence and AI-mediated social dynamics	Calleja, 2007a, 2007b, 2011; Calleja et al., 2016; Herrewijn et al., 2013
Narrative	Engagement with both authored and emergent narrative structures that contextualise player actions within the game context	Calleja, 2007b, 2011, 2013; Calleja et al., 2016; Herrewijn et al., 2013
Ludic	Engagement with rule systems, goals, constraints, and strategic problem-solving within the game’s formal structure	Calleja, 2007a, 2007b, 2011; Calleja et al., 2016; Herrewijn et al., 2013
Affective	Emotional responses arising from gameplay situations, aesthetics, tension, feedback, and perceived stakes	Calleja, 2007b, 2011; Calleja et al., 2016; Herrewijn et al., 2013

Table 1: Six dimensions of involvement across micro and macro scales

Taken together, the six dimensions illustrate Calleja’s argument that gameplay experience is not reducible to a single mode of engagement, but is instead constituted through multiple simultaneous forms of involvement. These dimensions interact dynamically during play, with different aspects becoming more or less prominent depending on context, while still contributing collectively to the player’s situated experience of the game world.

3.3.3 From “Immersion” to Incorporation

Calleja critiques “immersion” as an imprecise and overextended term that is often used to describe gameplay experience in overly general ways, sometimes implying a one-way movement of the player into a separate game world (Calleja, 2007a, 2007b, 2011). He argues that this metaphorical framing risks simplifying the complexity of gameplay by treating engagement as a singular experiential state. In particular, metaphors of transportation or absorption tend to obscure the active, situated, and embodied nature of play. Instead, he proposes the concept of incorporation, which describes how players inhabit and engage with virtual environments through a continuous relationship between perception, action, and system structure.

This concept operates through a dual process. On the one hand, the game environment is taken in as a habitable domain, meaning that the player comes to perceive it as a space that can be learned, navigated, and acted within through familiarity with its spatial and systemic structures. On the other hand, the player is situated within that environment through the avatar, which provides a stable point of embodiment and allows the player to act within the systemically maintained space of the game world (Calleja, 2007a, 2007b). Rather than implying entry into another world, incorporation describes how engagement is sustained through this simultaneous process of environmental assimilation and embodied presence.

From this perspective, engagement within the game is understood as a form of situated mediation, where perception, control, and interpretation are continuously shaped by the game system. Meaningful action arises from ongoing participation within a structured environment that the player gradually learns to read, inhabit, and operate within.

Supporting this process are multiple co-present dimensions of involvement that structure gameplay experience. These include ludic involvement (engagement with rules, goals, and constraints), kinesthetic involvement (moment-to-moment control and movement), spatial involvement (navigation and understanding of environment), shared involvement (interaction with other agents), narrative involvement (engagement with story structures), and affective involvement (emotional responses) (Calleja, 2007a, 2007b; Calleja et al., 2016; Herrewijn et al., 2013). Rather than operating independently, these dimensions overlap and reinforce one another during play, shaping a coherent sense of situated engagement.

Taken together, these dimensions indicate that incorporation is not a discrete end-state, but an ongoing condition that emerges when different forms of involvement become sufficiently integrated through sustained play. It describes a dynamic experience of participation in which the player develops familiarity with the game’s systems while remaining actively situated within them.

To summarise, *In-Game: From Immersion to Incorporation* replaces a singular and often ambiguous notion of immersion with a multidimensional framework of player involvement. Through the interplay of spatial, kinesthetic, shared, narrative, ludic, and affective involvement, incorporation describes a sustained experience of situated participation, where the player is simultaneously engaged in navigating, interpreting, and acting within a systemically structured game environment.

3.4 Spatial Restriction and Horror Design

In this Section, we investigate how horror games create tension through anticipation, uncertainty, and player vulnerability. We are particularly interested in how environmental and mechanical restrictions contribute to sustained emotional pressure within linear experiences.

3.4.1 Confined and Linear Spaces

A foundational principle in horror level design is that the structure of a space communicates expectations to the player before any explicit threat is introduced. Mitchell argues that scares and dread in horror games are not derived from mechanics that are innate to the genre, but rather from how those mechanics are contextualised within a space (Mitchell, 2015). This positions level design as the primary instrument through which tension is constructed: the environment does not merely host the horror, it produces it.

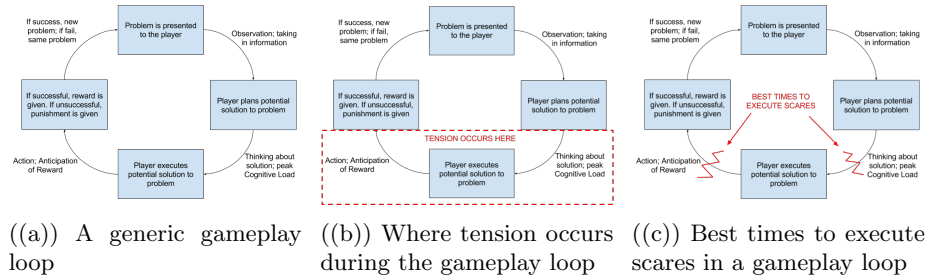


Figure 19: Horrors gameplay loop structure analysis by Mitchell, 2015

Central to this is the role of the gameplay loop, which Mitchell defines as the cycle through which a player identifies a problem, plans a solution, executes it, and receives a reward or consequence. Tension, in this framework, arises when the player is actively engaged in planning or executing a solution but is

simultaneously losing access to the resources needed to complete it, whether those resources are time, space, or available actions (Mitchell, 2015). This understanding of tension as resource depletion within an established loop is directly relevant to confined corridor environments, where the spatial constraints of the level already limit what resources are available to the player.

Linear level structures support this tension model by guiding the player along a predetermined path, ensuring that the gameplay loop remains legible and that the player understands what is expected of them at each stage. Jenkins similarly frames linear spatial progression as a form of narrative architecture, in which the sequencing of spaces does the work of storytelling by controlling what the player encounters and when (Jenkins, 2004). Totten further extends this, arguing that corridor-style environments use spatial narrowing and the absence of branching paths to concentrate player attention and heighten the emotional stakes of forward movement (Totten, 2019). In this sense, linearity is not a limitation of the design but a deliberate compositional choice.

Claustrophobic and Restricted Spaces

The spatial properties of confined environments amplify the tension generated by the gameplay loop by reducing the margin for error available to the player. Mitchell observes that effective chase sequences in horror games, such as those found in *Amnesia: The Dark Descent* (Frictional Games, 2010) and *Outlast* (Red Barrels, 2013), operate through largely linear layouts in which the player’s only meaningful option is forward movement (Mitchell, 2015). However, Mitchell notes a critical distinction: the most effective of these sequences introduce limited decision points, such as diverging paths that immediately converge, or objects that can be used to slow a pursuer. These choices are structurally meaningless in terms of outcome, yet they produce significant psychological pressure precisely because the player does not know this. The perception of choice, rather than choice itself, becomes a source of stress.

This observation has direct relevance to our design context. It suggests that a fully linear corridor can sustain tension not only through spatial constraint but through the strategic placement of moments that create the *impression* of agency without granting it. Nitsche similarly argues that restricted spaces exert pressure on the player’s sense of orientation and control, making the environment itself feel active rather than passive (Nitsche, 2008). Within claustrophobic spaces, the walls, ceiling, and path ahead are not neutral features but constant reminders of what the player cannot do.

Environmental Readability and Navigation

Readable environments are conventionally understood as a design virtue: spaces should communicate their logic to the player so that navigation feels purposeful rather than arbitrary. Mitchell’s analysis of effective chase sequences highlights how previewing, the technique of allowing players to traverse a space

before they are tested on it under pressure, ensures that the player understands the environment well enough to navigate it when resources and time are scarce (Mitchell, 2015). Without this, spatial pressure becomes frustration rather than tension, since the player cannot form a plan if they do not understand where they are.

Totten reinforces this, describing how corridor environments use visual cues, lighting, and architectural landmarks to guide the player’s attention and sustain a coherent sense of progress (Totten, 2019). Environmental readability therefore functions as a prerequisite for effective tension: the player must first understand the space in order to feel the weight of losing it.

3.4.2 Tension Through Environmental Design

Where the preceding discussion establishes how spatial structure and linearity shape the conditions under which tension can occur, this Section examines the specific environmental tools through which that tension is produced and sustained. The distinction matters: linearity and confinement create the preconditions for horror, but it is the moment-to-moment management of visibility, sound, light, and information that determines whether those preconditions are felt by the player.

Perron’s analysis of horror game design draws attention to the role of *dread* as distinct from shock or surprise. Whilst jumpscare operate through the sudden violation of an established expectation, dread is the sustained emotional state produced by the anticipation of something that has not yet arrived (Perron, 2018). This distinction is practically significant for level design: dread requires duration, and duration requires an environment that withholds resolution. A space that reveals its threats immediately cannot sustain dread; it can only deliver shock. Environments designed for horror must therefore actively manage what the player can and cannot perceive, controlling the rate at which information is released in order to keep the player in a prolonged state of uncertain anticipation.

Krzywinska similarly identifies the management of knowledge and ignorance as a foundational mechanism of horror (Krzywinska, 2002). She argues that horror is structurally dependent on an asymmetry between what the player suspects and what they can confirm, an asymmetry that environmental design can either support or undermine. When a space is visually legible and acoustically transparent, the player rapidly closes the gap between suspicion and knowledge, and tension dissipates. Confined corridors are particularly effective at maintaining this asymmetry because their geometry naturally restricts sightlines: the bend at the end of a passage, the darkness beyond a light source, or the doorway to an unlit room each represent an epistemic boundary the player cannot cross without advancing into potential danger. The environment does not need to place a threat around every corner to produce fear. It only needs to make the player uncertain about what is there.

This relationship between visibility and tension is central to *Outlast*'s environmental design. The game's reliance on a diegetic camcorder with limited night vision does not merely restrict what the player can see, it makes the act of seeing itself a resource. Darkness is not simply the absence of light; it is a domain that can only be entered at the cost of battery power, and the gradual depletion of that resource introduces a form of temporal pressure that transforms every unlit corridor into a decision about how much visibility is worth expending (Red Barrels, 2013). The environmental design exploits this by constructing spaces in which darkness is unavoidable, ensuring that the player's perceptual access to the environment is never fully secure.

Sound design operates in parallel with visual restriction to sustain environmental tension. Chen observes that immersion in horror games is strongly shaped by audiovisual composition, and that sound in particular functions as an anticipatory cue, alerting players to threats before those threats become visible (Chen, 2025). Footsteps, ambient groaning, distant impacts, and changes in acoustic texture all contribute to the player's ongoing threat assessment, making the environment feel inhabited and responsive even when nothing is visually present. In confined spaces, where sound cannot be spatially avoided, these cues become impossible to ignore. The player cannot step back from the audio environment the way they might look away from a visual one. Sound fills the space and, in doing so, extends the perceptual reach of horror beyond the limits of the camera.

Taken together, these mechanisms produce what might be understood as *environmental pressure*: a sustained affective state generated not by discrete events but by the continuous management of sensory access. The player is not frightened by what they see so much as by what the environment prevents them from seeing, and by the knowledge that resolution, whether in the form of confrontation, escape, or revelation, is always deferred. This is the condition that confined and linear level design is uniquely positioned to retreat, when visibility is constrained by darkness or camera range, and when sound design sustains a persistent sense of inhabited threat, the environment itself becomes the primary instrument of horror. Level design in this mode is not a container for horror mechanics but the mechanism through which fear is produced.

3.5 Summary

This Section has established the theoretical foundations that underpin the design and evaluation of confined and linear horror experiences within this thesis. Across the four areas examined, a central argument emerges: that restriction does not inherently diminish player engagement, but can instead restructure and intensify it when applied deliberately within a designed system.

Player agency was introduced not as unrestricted freedom, but as the perceived ability to perform meaningful actions within a structured environment. Drawing on Murray, 2016 ver. Juul, 2005, and Mateas and Stern, 2005, agency

emerges through the alignment between player action, system response, and coherent feedback. Crucially, this understanding reveals that confined and linear spaces need not eliminate agency, but may instead redirect it towards navigation, interpretation, and moment-to-moment decision-making under pressure.

Player engagement was further examined as a multidimensional process encompassing cognitive, emotional, and behavioural dimensions. Building on the frameworks proposed by Rashed et al., 2025 and Zhang, 2024, engagement is understood as a dynamic relationship between the player, the game system, and the surrounding environment, sustained through attentiveness, immersion, challenge, and emotional investment rather than mechanical abundance or unrestricted interaction alone.

Player involvement and immersion were subsequently explored through Murray, 2016 ver.'s concept of participatory engagement and Calleja, 2011's multidimensional model of player involvement. Rather than treating immersion as a singular experiential state, Calleja, 2011's framework distributes engagement across six interrelated dimensions: kinesthetic, spatial, shared, narrative, ludic, and affective involvement. Together, these dimensions give rise to incorporation, a sustained condition of situated participation in which the player simultaneously inhabits and acts within a systemically structured environment. Within horror contexts, Chen, 2025 further demonstrates that immersion is shaped through atmosphere, sensory design, and emotional tension rather than empowerment, suggesting that vulnerability and uncertainty can serve as primary drivers of sustained player involvement.

Finally, spatial restriction and horror design were examined through the lens of level design theory. Drawing on Mitchell, 2015, Jenkins, 2004, Totten, 2019, Perron, 2018, and Krzywinska, 2002, confined and linear environments were shown to produce tension not through mechanical complexity, but through the deliberate management of visibility, sound, spatial legibility, and perceived agency. The asymmetry between what the player suspects and what they can confirm, sustained through restricted sightlines, controlled lighting, and anticipatory sound design, positions the environment itself as the primary instrument through which horror is produced.

Taken together, these theoretical perspectives form the analytical framework applied throughout the remainder of this thesis. They inform both the design decisions embedded within the developed prototype and the evaluation of player behaviour, spatial engagement, and emotional response observed during playtesting.

4 Design Consideration

In this Section, we present the broader design considerations that informed the development of our prototype. The purpose of this Section is to outline the central design intentions, gameplay concepts, and experiential goals that guided the project before implementation. Rather than focusing solely on technical production, these considerations establish how the prototype was shaped in relation to the theoretical perspectives discussed previously, particularly regarding player agency, restriction, spatial tension and horror engagement. Through this design framework, we define the core ideas, mechanics, environmental structure, and aesthetic direction that together form the foundation of the overall player experience.

4.1 Game Design Concept

Our concept for *Haunted Hollow* emerged from a desire to situate the player directly within the lived experience of a content creator. Not as a detached observer, but as someone fully embedded in the act of performing for an audience whilst simultaneously losing their grip on reality.

The premise centres on a livestreaming content creator whose primary focus is urban legends and paranormal investigation. Seeking material for their channel, the player character (PC) travels to *Haunted Hollow*, a largely forgotten mining location carrying a local legend: the miners who once worked there disappeared without explanation and were never recovered. The location is not widely known, but the village surrounding it has preserved the memory of its lost workers, and it is precisely this obscurity that attracts the protagonist, an opportunity to uncover something overlooked.

The PC has undergone a procedure in which a chip was implanted in their brain. The PC has since hacked this chip and is now able to intercept electrical signals from the visual cortex³ and use this data for livestreaming purposes. This diegetic camera serves as the central framing device of the experience, anchoring the found-footage aesthetic not in a handheld prop but in the player’s own body. The audience watches through the protagonist’s eye, blurring the boundary between performer and performance.

The core spatial constraint of the original concept is the adit: a horizontal mine tunnel with no branching paths, no alternate routes, no hiding and no means of retreat. The player can only move forward. This structural decision was deliberate. The adit functions simultaneously as a narrative environment and as a mechanical restriction of agency, directly investigating how a single-axis, corridor-style level shapes player engagement when meaningful spatial choice is absent (Totten, 2019).

While the player progresses through the adit, a simulated live audience interacts with the stream in real time. Viewers react, comment, and donate, and

³The light received through the eyes being converted into electrical signals

these donations feed directly into the brain chip the protagonist has had implanted. The protagonist has covertly modified the device, cracking its firmware to allow incoming donations and chat interactions to directly influence their own actions and motor responses. The audience, in effect, exerts physical agency over the PC. This inversion is thematically deliberate: the player performs for an audience that increasingly controls them. The structure draws on a lineage of entertainment forms in which the boundary between performer and victim has always been deliberately blurred. From the dance marathons depicted in *“They Shoot Horses, Don’t They?”*, 1969, where exhaustion and suffering became spectacle, to the livestreaming formats explored in *“Deadstream”*, 2022 and *“Gonjiam: Haunted Asylum”*, 2018. What distinguishes the livestream format, and by extension our artifact, is that the audience does not merely observe this dynamic. They actively participate in it through donations and chat interactions that shape the performer’s experience in real time.

As the player advances deeper into the tunnel, abnormal events begin to occur. These are initially ambiguous, close enough to explainable phenomena that the player cannot be certain whether they are experiencing genuine supernatural activity or the early effects of cognitive disturbance. This ambiguity is central to the concept. What the player does not know at the outset is that the adit contains dangerous concentrations of toxic gas and that prolonged exposure is the most probable explanation for the disappearance of the original miners. The hallucinatory escalation the player experiences is therefore grounded in a plausible environmental cause, layering psychological horror over a naturalistic threat. This approach draws on the principle that horror is most effective when uncertainty is sustained, when the audience or player cannot distinguish between what is real and what is perceived (Chen, 2025).

The concept thus combined several interconnected design intentions: the found-footage aesthetic mediated through a diegetic eye-camera, the structural restriction of a single linear corridor, the integration of a “live” audience system that redistributes agency through the protagonist’s modified brain chip, and a narrative grounded in local legend and environmental realism. Together, these elements were intended to investigate how confinement, restricted player agency, and mediated perception interact to sustain engagement within a horror context.

4.1.1 Genre

The design of our prototype sits at the intersection of two genre traditions: the walking simulator and the horror game. Rather than replicating the established conventions of either genre in isolation, we approach it as a focused exploration of how their overlapping qualities, specifically spatial composition, pacing, environmental cues, and the deliberate restriction of agency, can become the primary carriers of experience. In this sense, the prototype foregrounds restriction not as a limitation to be overcome, but as a defining condition through which tension, meaning, and involvement can emerge.

As established in the theoretical framework (Section 3.3.1 and 3.4), restriction within horror games functions not as a removal of agency, but as a restructuring of how agency is experienced. Horror as a genre has a long tradition of deliberately limiting player control, reducing available information, and constraining movement in order to intensify emotional engagement and attentiveness towards environmental cues (Chen, 2025). Our prototype draws directly on these principles, employing spatial confinement, perceptual restriction, and environmental pacing as its central design strategies. The horror context is therefore not incidental to the design but integral to it: the confined, linear corridor would carry a different experiential quality outside of a horror framing.

The walking simulator genre serves as a relevant secondary point of reference for this investigation, due to ongoing discussions in game studies regarding its classification and design principles (Ballou, 2019; Clark, 2017; Consalvo and Paul, 2019). Walking simulators already foreground environmental exploration and reduced mechanical complexity, and our prototype extends this reduction of agency further by limiting not only systemic interaction but also aspects of navigational and perceptual freedom typically assumed within the genre. In this respect, the prototype can be understood as occupying a position at the extreme end of the walking simulator spectrum, where even the minimal forms of agency typically associated with the genre, such as exploratory freedom and interpretive autonomy, are partially constrained. However, unlike many walking simulators, this reduction of agency is not simply a structural feature but a horror design strategy: by compressing player freedom into a highly directed and controlled experiential structure, the design uses restriction itself as a mechanism for generating dread, uncertainty, and sustained involvement. This allows the project to examine how engagement shifts when the already limited agency of walking simulators is further compressed within a horror context, and how the affective qualities of horror can persist and even intensify under such conditions.

4.1.2 Structure

Mitchell’s framework for effective horror level design rests on a foundational assumption: that the player must first understand the rules of their environment before those rules can be used against them (Mitchell, 2015). Tension, in his model, emerges from the erosion of resources (time, space, available actions) within a loop the player already comprehends. Jumpscare land because a mechanic has been established and then violated. Chase sequences work because the player knows the enemy, knows the space, and is still outpaced. The entire framework presupposes a player who has been taught what to expect, and then experiences the horror of losing it. *Haunted Hollow* is structured as a deliberate inversion of this model.

Rather than establishing a legible loop and then threatening it, the level’s structure progressively withdraws the conditions that would make such a loop possible. The player is not given the grammar of the space and then subjected to pressure within it. Instead, the grammar itself is withheld. Forward movement

is the only option from the outset, not as a consequence of crisis, but as a baseline condition the player never negotiates. There is no previewing phase, no moment of calm traversal that prepares the player for subsequent pressure. The adit offers no branching paths, no dead ends that converge, no illusory choices of the kind Mitchell identifies as the source of psychological stress in Frictional Games, 2010's chase sequences. Where Mitchell's effective horror levels preserve the perception of agency even as they remove meaningful choice, *Haunted Hollow* removes the perception itself. The player is not deceived about their freedom. They simply do not have any.

This subversion is structural, not incidental, and it is realised through the level's modular looping architecture. The level is composed of interconnected corridor modules that tile seamlessly as the player advances, producing the experience of continuous forward movement through a space that is modular. The player's subjective experience is of descent; the underlying structure is a closed circuit. This directly references the spatial disorientation found in "Grave Encounters", 2011, where corridors shift and exits disappear, and it operationalises Nitsche's observation that the manipulation of expected spatial behaviour is among the most psychologically unsettling instruments available to a level designer (Nitsche, 2008).

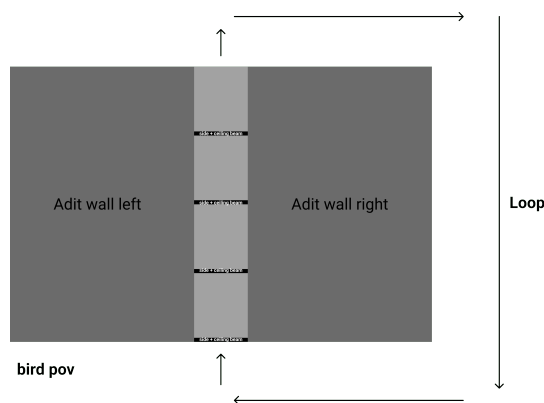


Figure 20: One adit module

Two specific loop types are embedded within this modular structure. The first is the walk loop: the player's default movement is an unhurried, forward-only walk. This pace is not framed as a limitation but as the natural register of cautious exploration, the cadence of a livestreamer narrating their surroundings. It produces a sustained low-level vulnerability that Mitchell's framework would associate with the planning phase of a gameplay loop, except that here no problem has been clearly presented, no solution is available to plan, and no reward is forthcoming. The player is perpetually mid-loop without ever completing one. The second is the auto-sprint loop, triggered by specific donation

events from the simulated live audience. When activated, the player's movement is forcibly accelerated and cannot be interrupted. Control is not merely reduced; it is briefly confiscated entirely. The player becomes a body moving through a corridor at a speed and for a duration they did not choose. This is not a chase sequence in Mitchell's sense, because there is no enemy the player is outrunning and no spatial knowledge they are drawing on. It is the structure of a chase sequence emptied of its logic, the feeling of flight without the legibility of threat.

Together, the walk loop and auto-sprint loop define the two poles of the player's kinesthetic experience: enforced passivity and enforced urgency, with no stable middle ground that would allow for the kind of problem identification and solution planning Mitchell identifies as necessary for tension to function. What the player experiences instead is something closer to the condition Mitchell's model assumes as a starting point, the absence of meaningful action, sustained not as a transitional horror beat but as the permanent state of the level itself.

The modular structure also means that Mitchell's concept of previewing has no purchase here. There is no space the player traverses calmly before being tested on it under pressure, because the space never stabilises enough to be learned. Modules that appear in the walk loop reappear in altered form during auto-sprint sequences, and environmental changes introduced by the gas hallucination system further erode the player's ability to construct a reliable spatial model. The level is not simply linear. It is linear in a way that resists the cognitive anchoring that linearity is conventionally supposed to provide.

This structural design positions *Haunted Hollow*'s corridor not as a container for horror mechanics but as a sustained argument about what horror can be when the gameplay loop itself is the thing removed.

4.2 Narrative

The narrative of *Haunted Hollow* is constructed around two layered stories that the player experiences simultaneously: the surface story of a content creator livestreaming an investigation, and the buried history of the adit itself and the miners who never returned from it.

See the first mockup of Haunted Hollow structure from the Narrative point-of-view in Appendix 1

4.2.1 The Player Character and Setup

As established in the Game Design Concept (Section 4.1), the player character is a content creator who travels to *Haunted Hollow* in search of material for their paranormal investigation channel. Their stated goal upon entering the adit is straightforward: walk through it, document what they find, and produce content. This surface motivation is consistent with the livestreaming format and with the broader tradition of paranormal investigation media discussed in

Section 2.

What distinguishes the player character’s situation is the arrangement through which their stream operates. The brain chip, originally implanted for a separate purpose, has been covertly repurposed: its firmware cracked to allow incoming donations and chat interactions to feed directly into the device and influence the player character’s motor responses. The audience does not merely watch. Through donations, they exert physical control over the body of the person performing for them. This arrangement is the player character’s own doing, a deliberate trade of bodily autonomy for audience engagement and monetisation, and it frames the entire experience as a performance that has already ceded something before it begins.

What the player character does not know is that their stated goal is already unreachable, not because of supernatural forces, but because of the environment itself.

4.2.2 The Adit and the Miners

The history of *Haunted Hollow* predates the player character’s arrival by decades. When the adit was operational, its miners disappeared one day without explanation. The true cause of the miners’ disappearance is gas poisoning. Prolonged exposure to high concentrations of the gas within the adit produced severe hallucinatory states, causing the miners to become disoriented and to flee from one another. In their altered states, some squeezed into crevices and natural cave extensions that under normal circumstances they would not have attempted to enter. Within these deeper spaces, naturally occurring water sources filtered the air sufficiently to ease the acute effects of exposure, trapping the miners in a state of chronic, low-level poisoning rather than killing them outright. They did not die in the adit. They lived in it.

Over time, the surviving miners fractured into two groups shaped by the character of their shared hallucinations. The first group entered a state of collective psychosis, their hallucinations consolidating into an emergent belief system in which other people were perceived as hostile presences. They became violent and incapable of reasoning with. The second group retained greater cognitive coherence but grew increasingly desperate. Their attempts to locate an exit brought them into contact with the first group, resulting in violent encounters they could not de-escalate. Faced with dwindling resources and mounting deaths, the second group began to cannibalise the dead. As time progressed, sustained gas exposure and guilt drove members of this group toward the same delusional states that had consumed the first, turning former allies into new threats. The cycle of conflict continued until no one remained.

This history is not delivered to the player directly. It is present in the environment, in what the player character finds, narrates, and slowly begins to misinterpret as their own exposure to the gas increases.

4.2.3 The Hallucinatory Progression

The central narrative mechanic of *Haunted Hollow* is the player character's gradual cognitive deterioration. At the outset, anomalous events within the adit are ambiguous: close enough to explainable phenomena that neither the player character nor the audience watching the stream can be certain whether they are witnessing genuine supernatural activity or early symptoms of something environmental. This ambiguity is sustained deliberately. The player character's monologue, directed at the live audience, initially frames unsettling occurrences within the conventions of paranormal investigation content. Strange sounds become evidence. Shadows become presences. The audience reacts accordingly, and donations increase.

As the player progresses deeper into the adit, the hallucinatory events intensify and become less easily rationalised. The environment itself begins to behave inconsistently, a process reinforced at the structural level by the looping modular architecture described in the previous Section. What the player character interprets as the adit changing around them is, from the audience's perspective, increasingly difficult to frame as content. The performance begins to slip. The player character's narration becomes less coherent, more reactive, and eventually more desperate. The layer the player character cannot access is the one the environment encodes: that what they are experiencing mirrors, in compressed and accelerated form, exactly what the miners experienced before them. The hallucinations are not supernatural. The presence they sense is not a ghost. The adit is simply doing to them what it has always done.

4.2.4 The Audience as Antagonist

The relationship between the player character and their live audience does not remain static across the experience. At the outset, the dynamic mirrors the one observed in *"Deadstream"*, 2022 and *"Gonjiam: Haunted Asylum"*, 2018: the streamer performs, the audience watches and reacts, and donations function as a form of approval and encouragement. The player character is in a position of relative control, the one with the camera, the one narrating, the one deciding what to show and how to frame it.

As the hallucinatory progression deepens, this balance shifts in ways that connect directly to the thematic lineage identified in the analysis of *"They Shoot Horses, Don't They?"*, 1969. What that film makes visible is the degree to which an audience's appetite for entertainment does not diminish as the performer deteriorates, it intensifies. The dance marathon spectators do not become sympathetic as the contestants collapse; they become more invested, because the suffering has become more real. The entertainment value of endurance is, at a certain point, indistinguishable from the entertainment value of watching someone break.

Haunted Hollow is designed to reproduce this dynamic within the livestreaming format. As the player character's distress becomes genuine, the chat does

not respond with concern, donations increase, viewer numbers climb. The chat, which in the early sections of the adit reflects the register of a typical paranormal investigation stream, begins to shift in tone: requests become demands, encouragement becomes pressure, and the threshold between the audience pushing the player character forward for entertainment and pushing them forward knowing they are frightened and do not want to continue becomes deliberately impossible to locate. The audience is not malicious in any legible way. They are simply doing what audiences have always done, which is to consume the experience in front of them without bearing its cost.

The donation system makes this dynamic mechanical as well as narrative. Because donations trigger the auto-sprint loop and other forced responses through the brain chip, the audience's desire to see the player character go further is not merely expressed in the chat but enacted on the player character's body. The player character cannot refuse. The performance of willingness, already strained, is eventually replaced by the performance of someone who has lost the ability to distinguish between what they are choosing to do and what is being done to them. This is the structure *They Shoot Horses, Don't They?* identifies beneath the surface of endurance entertainment, and it is precisely the structure *Haunted Hollow* seeks to make interactive.

What complicates this further is the deterioration of the boundary between the chat and the player character's own interiority. In the later sections of the adit, as gas exposure erodes cognitive coherence, the simulated chat begins to surface content that could not plausibly originate from an external audience. Comments appear that reference things the player character has not said aloud, fears they have not narrated, memories that belong to their private self rather than their performed persona. The boundary between what is being watched and what is being thought begins to dissolve. It is no longer clear whether the chat is an external feed or a projection of the player character's own fragmenting consciousness externalised onto the interface they are most accustomed to reading.

This ambiguity is not resolved. Whether the audience has always been a mirror of the player character's inner state, or whether the player character has simply reached a point at which they can no longer distinguish the two, is left open. What the experience makes visible is the degree to which the livestreaming format, built on the sustained performance of a self for an audience, creates a particular vulnerability to this kind of collapse. The performer who has spent long enough narrating their experience for others may find, at sufficient depth and under sufficient pressure, that they are no longer certain which voice is theirs.

4.2.5 Carbon Poisoning and the Nature of Hallucination

The environmental threat at the centre of *Haunted Hollow*'s narrative is grounded in a real and historically documented phenomenon. The primary at-

atmospheric hazard present in the adit is blackdamp⁴, a term used in mining to describe an irrespirable atmosphere produced by the displacement of oxygen through the accumulation of carbon dioxide and nitrogen. Blackdamp has been responsible for numerous mining disasters throughout history, operating as a silent and invisible killer precisely because it produces no immediate sensory warning: no smell, no colour, no sound. In enclosed subterranean environments with limited ventilation, it accumulates in low-lying areas and deepens progressively as a body moves through the space. The miners of *Haunted Hollow* would not have known they were being poisoned until the cognitive effects were already well advanced.

As the decomposition of the miners who did not survive the initial exposure progressed over the years following the disappearance, a second atmospheric condition developed within the deeper sections of the adit. Which is Mazuku⁵, a localised concentrations of carbon dioxide produced by the biological decomposition of organic matter in enclosed or subterranean environments.

The physiological effects of prolonged CO₂ exposure at elevated concentrations are well documented and include headache, disorientation, accelerated breathing, impaired judgement, and, at sufficient concentrations, hallucination and loss of consciousness. These effects provide the narrative with its grounded causal logic: what the player character experiences as the adit deepens is explicable entirely within the framework of environmental poisoning, and the arc of their deterioration follows the physiological progression of that exposure with reasonable fidelity.

However, the specific character of the hallucinations the player character experiences does not map cleanly onto what blackdamp and mazuku alone would produce. CO₂ poisoning at the concentrations present in an enclosed mining environment typically generates confusion, spatial disorientation, and a generalised sense of dread, but not the structured, narrative-coherent visions that increasingly populate the player character's experience of the adit. The hallucinations in *Haunted Hollow* have a quality that exceeds what the documented atmospheric conditions would straightforwardly account for: they are too specific, too shaped, too legible as meaning rather than merely as symptom.

This excess is acknowledged within the fiction rather than explained away. The atmospheric composition of the adit is understood, within the world of the game, to be specific to this location in ways that have not been fully char-

⁴Blackdamp refers to an irrespirable atmosphere found in mines, characterised by an elevated concentration of carbon dioxide and nitrogen and a corresponding depletion of oxygen. The term has been in documented use in British mining literature since at least the eighteenth century. Galloway, 1882

⁵Mazuku is a Swahili term meaning *evil wind*, used to describe localised ground-level concentrations of carbon dioxide associated with volcanic activity or the decomposition of organic matter in enclosed environments. The phenomenon is most extensively documented in the African Great Lakes region, particularly around Lake Nyos and Lake Kivu, where CO₂ seepage from lake beds has caused mass casualties among both humans and animals. Kling et al., 1987

acterised. Whatever accumulated in the sealed tunnel across the decades of decomposition and geological process is not a standard industrial atmosphere. It is something particular to *Haunted Hollow*, something that produced the specific collective psychoses of the two miner groups, something that shaped their hallucinations into structured belief systems rather than simple confusion, and something that now acts on the player character with the same specificity. The gas is diegetic in the fullest sense: it belongs to this place, it carries the history of this place, and it produces experiences that are in some sense about this place, even as it destroys the cognitive capacity to understand what those experiences mean.

This acknowledgement is important for two reasons. The first is narrative honesty. *Haunted Hollow* does not present itself as a supernatural horror experience and then quietly rely on supernatural logic to motivate its most striking moments. The hallucinatory content is real in the sense that it is genuinely being experienced, and it is caused in the sense that something in the environment is producing it, but the precise mechanism remains opaque both to the player character and to the player. The second reason is thematic. The indeterminacy of the hallucinations, their quality of being almost but not quite accountable for by the known atmospheric conditions, preserves the ambiguity that is central to the experience. The player character cannot be certain whether what they are seeing is a symptom, a memory, a projection, or something the adit itself is in some sense communicating. That uncertainty is not a gap in the design. It is the design.

4.2.6 Environmental Manipulation

The conventions described in Section 3.4, legible gameplay loops, meaningful resource pressure, previewed spaces, and structured linearity, represent what Mitchell, 2015 identifies as the conditions under which horror level design functions effectively. They presuppose a player who understands the rules of their environment well enough to feel the threat of losing access to them.

Our artifact, however, is designed to operate against this framework in a specific and intentional way. Rather than establishing a readable loop and then threatening it, *Haunted Hollow* constructs a corridor in which the conventions of spatial legibility are progressively withdrawn. The player is not taught the rules of the environment and then subjected to pressure within them. Instead, the environment itself becomes unreliable: the further the player advances into the adit, the less the space behaves according to the logic they were initially given. This draws on the spatial disorientation observed in works such as “*Grave Encounters*”, 2011, where corridors shift and exits disappear, as well as on Nitsche’s observation (Nitsche, 2008) that the manipulation of expected spatial behaviour is among the most psychologically unsettling tools available to a level designer.

Crucially, this subversion also extends to the player’s sense of agency itself. Mitchell’s model assumes that the player retains at least the perception of mean-

ingful action, that even illusory choices carry weight because the player does not know they are illusory (Mitchell, 2015). In *Haunted Hollow*, this assumption is deliberately undermined. The player’s actions are increasingly mediated and overridden by the simulated live audience through the protagonist’s modified brain chip, removing even the perception of self-directed agency. The corridor does not simply restrict what the player can do. It transfers the authority to act to an external system entirely outside the player’s control. The level design thus functions not as a container for tension in Mitchell’s conventional sense, but as an instrument through which agency is systematically dismantled, transforming spatial confinement into a condition the player cannot reason or navigate their way out of.

4.2.7 Level Design

For the level design, we developed a small modular section of the adit that can be repeated and connected to construct a longer continuous environment. This establishes a modular structure in which individual sections can be combined in sequence while maintaining a consistent spatial language throughout the level.

As described in earlier Sections, the intended experience is structured around a linear progression in which the player primarily moves forward, rather than navigating a branching or open environment. This linearity is maintained through the modular composition of the level, ensuring that each segment reinforces forward-directed movement while preserving spatial consistency across repeated sections. The enclosed structure of the adit further contributes to the intended experience of vulnerability, as the confined environment limits opportunities for concealment or avoidance, keeping the player consistently exposed within the space. The adit’s linear structure thus eliminates the possibility of spatial avoidance entirely, operationalising the epistemic restrictions that Krzywinska, 2002 and Perron, 2018 identify as constitutive of horror: the player cannot circumvent the environment, only move deeper into it.

The narrative structure is also shaped by this modular and sequential level composition, as it must be embedded within a strictly linear progression through the adit. Rather than unfolding through branching paths or non-linear exploration, the narrative is constrained to the order in which modular sections are encountered. This means that story elements, environmental cues, and contextual information are delivered in a fixed sequence that aligns with the player’s forward movement through the space. As a result, narrative progression becomes inseparable from spatial progression, with each segment of the adit contributing incrementally to the unfolding of the experience while maintaining consistency within the overall linear structure. This sequential delivery also governs the pacing of the hallucinatory progression: as the player advances through successive modules, the environment becomes less readable and more acoustically ambiguous, ensuring that their capacity to distinguish between real and perceived threat erodes in direct proportion to their spatial progress. Envi-

ronmental design in this context operates not only as a source of tension but as a narrative instrument, encoding the same cognitive deterioration in the space that the monologue system encodes in language.

4.2.8 Chat & Donation system

Since our premise centres around livestreaming, the core components of the prototype are the chat system and the donation system. We aim to simulate a chat system that, similar to real livestreams, sends reactive messages based on in-game events. The chat will also shift in tone depending on the player's progression, thereby creating variation in comments across different stages of the experience. In addition to the chat system, we also aim to implement a donation system that closely simulates livestream donation alerts. This system will be used as both an informational and gameplay element, providing players with notifications related to in-game events such as missed interactions, sudden threats, and jumpscare, while also introducing additional gameplay effects depending on the type of donation received.

Given that the progression system is strictly linear, both the chat and donation systems must be structured to reflect this sequential flow. As a result, their behaviour is designed to unfold in direct relation to the player's progression through the game, ensuring that messages and events are consistently aligned with the current stage of gameplay.

4.2.9 Monologue System

As the player, you embody a livestreamer who creates content for a living. For this reason, we aim to implement a monologue system to encapsulate the experience of being a livestreamer. Since the level progression is sequential, it is important that these monologues are triggered in a consistent and ordered manner to avoid confusion. Ideally, the monologues should be voiced, as this would add personality to the character and reduce the amount of on-screen reading for the player, enhancing player engagement through a stronger sense of presence and embodiment within the livestreamer role.

5 Initial Design

For this Section we will present the initial version of the prototype, where the primary focus was on establishing the core mechanics, the environmental structure, and the overall feel of both systems in combination. At this stage, the design was exploratory, with an emphasis on how interaction and spatial composition work together to shape the player's experience. These early design decisions form the foundation for the later development of the prototype and provide an initial reference point for how mechanics, environment, and atmosphere interact within the intended experience.

5.0.1 Structure

The environment selected for the prototype was the adit, a horizontal mine tunnel whose spatial properties are discussed in detail in Section 4.1. Given the two-person composition of the development team, a modular approach to level construction emerged as both a practical and conceptually coherent solution. Rather than constructing a continuous and fixed environment, the level was built around a single adit section that could be connected seamlessly to itself in sequence, tiling repeatedly to produce the impression of continuous forward movement through an extended corridor. This modular structure made iteration considerably more manageable, as changes to the base section propagated across the entire level, and facilitated clearer communication between the design and development sides of the project.

The overall structure of the prototype is organised around three types of adit cluster: Scripted, Walk, and Run (see Appendix 2). The Walk and Run clusters share the same spatial composition and differ only in the speed at which the player character moves through them, with the Run cluster corresponding to the auto-sprint mechanic described in Section 4.1.2. The Scripted clusters represent a departure from the purely modular structure: these are independent segments built upon the base adit module but extended with objects and environmental elements specific to that portion of the level. Scripted clusters function as the primary delivery points for narrative content, environmental storytelling, and the interactable objects embedded within the experience.

The implementation of the structure is shown in Figure 21:

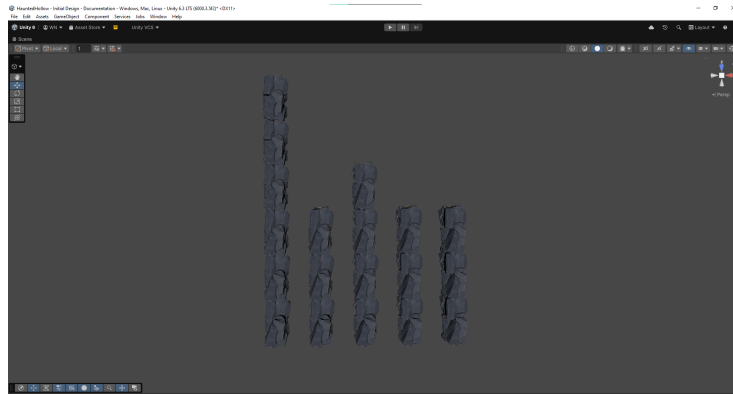


Figure 21: Initial Level implemented in Unity

5.0.2 Level Design

At this stage of development, the interactive and narrative objects intended for placement within the scripted clusters had not yet been implemented within the game environment. However, the design intention for these elements was es-

tablished and documented during this phase (see Appendix 3). Planned objects were positioned within the structural map and linked to their corresponding 3D models, accompanied by descriptions of their intended interactions and the narrative function each was designed to serve. This approach allowed the spatial logic and pacing of the interactable elements to be planned and communicated ahead of implementation, ensuring that the modular structure of the level could accommodate them without requiring significant revision at a later stage.

5.0.3 Written content

MC Monologue

To structure the player character’s narrative monologue, Twine was used as the primary tool (see Appendix 4). This allowed for internal testing of the narrative flow and reaction choice branching, which then later can be used to implement the monologue system.

The tone of voice chosen for the PC was designed to reflect the conventions of contemporary content creator culture, drawing on the performative and self-aware register typical of livestreaming personalities on platforms such as YouTube and Twitch. This decision served a dual purpose. First, it was intended to ground the character within the realistic setting the game sought to portray, reinforcing the found-footage aesthetic and the broader livestreaming framing. Second, it was intended to sustain player entertainment through either meta-commentary or the familiarity players might already have with the kind of persona being performed. This approach aligns with Goffman’s (Goffman, 1959) concept of impression management, in which performers consciously calibrate their self-presentation for an audience, a dynamic that becomes increasingly unstable as the player character’s cognitive state deteriorates over the course of the experience.

Chat Design

The initial chat design focused on recreating the atmosphere of a livestream audience reacting to the player’s actions throughout the experience. The chat consisted of a list of 50 predefined users, each assigned five individual comments stored within a single JSON file. During this early stage, the comments primarily consisted of casual and reactive messages intended to simulate viewer behaviour commonly found in livestream culture. The purpose of the chat was not only to reinforce the livestream framing of the prototype, but also to create a feeling of ongoing observation and participation from an unseen audience. This helped establish the foundation for how audience interaction could contribute to tension, pacing, and the overall tone of the experience.

Donation Design

During this stage of the prototype, the donation system was designed primarily around interruption and surprise. The initial implementation consisted of a

single donation event, written within a JSON file, that functioned as a jumpscare intended to imitate the sudden and attention-grabbing nature of livestream donation alerts. Rather than serving purely as interface elements, the donations were intended to become part of the horror experience itself by disrupting the player’s focus and creating moments of unexpected tension. This early design direction established donations as more than simple notifications, instead positioning them as gameplay-affecting events capable of influencing the player’s emotional state and perception of the environment.

5.0.4 Stream UI

The stream interface was considered highly important, as it functioned as a key design element capable of communicating the concept of livestreaming to the player. To ensure that this association would be effectively understood, we conducted desk research into industry standards by analysing the user interfaces of livestreaming platforms such as Twitch and YouTube, alongside various stream overlay templates commonly used by content creators. Through this analysis, we identified recurring interface conventions, including the placement of chat windows, notification systems, and recording indicators, as well as how information was prioritised spatially across the screen.

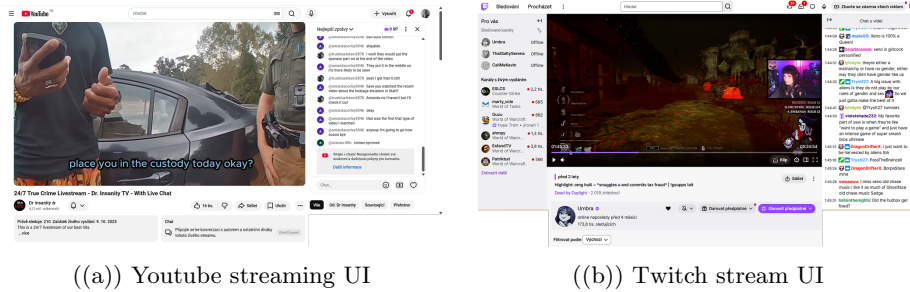


Figure 22: UI of real streaming platforms

This process was important because livestream interfaces have become highly recognisable visual systems through widespread exposure to online media culture. By reinterpreting these conventions within the game, we aimed to create an interface that would immediately communicate the intended context to players without requiring extensive explanation. In this sense, the UI itself became a form of environmental storytelling, framing the gameplay experience through the visual language of contemporary livestream platforms.

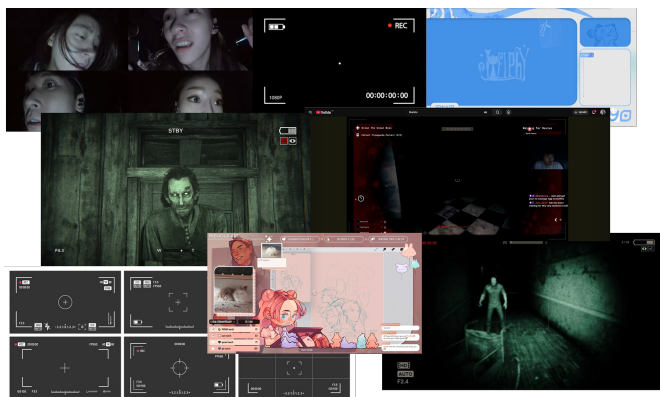


Figure 23: Stream UI moodboard

The placement and behaviour of the stream UI were also designed to reinforce the psychological themes explored throughout the project. Elements such as live chat messages and donation notifications continuously reminded the player of the audience’s presence, even during moments of isolation and vulnerability. This created a persistent feeling of observation and performativity, where the player was not only navigating a hostile environment, but also implicitly pressured to continue entertaining an unseen audience. As discussed earlier in relation to livestream culture and spectator-driven entertainment, this relationship between performer and audience became an important thematic component of the overall experience.

In addition to livestream culture, the interface design was heavily inspired by the visual language of the found-footage genre. Many of the analysed films and games utilise camera overlays, recording indicators, lens artefacts, and framing devices to constantly remind the audience that events are being mediated through a recording device rather than viewed directly. We wanted to translate this sensation into the gameplay experience so that the player would feel as though they were perceiving the environment through a technological lens rather than a traditional first-person game camera.

To support this, we implemented a small on-screen crosshair inspired by camera focus markers commonly seen in recording devices and games such as *Outlast* (Red Barrels, 2013). Whilst the element serves a practical gameplay purpose by helping players orient themselves and identify where they are looking within the environment, it also reinforces the illusion that the player is continuously viewing the world through a mounted livestream camera. Within the confined cave environments, where visibility and spatial orientation are intentionally restricted, the crosshair further helped ground the player’s focus whilst maintaining the mediated perspective associated with found-footage horror.

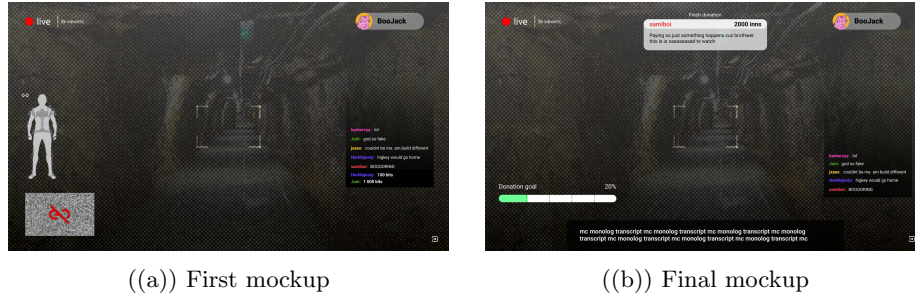


Figure 24: Mockups of the stream UI

5.1 Technical Description of Initial Design

The prototype was developed in Unity, a game engine with which both team members had prior hands-on experience. Given the scope and objectives of this project, Unity was well suited to the task: it supports rapid prototyping within a small team, and its tooling is sufficient for an experience whose primary design goals are atmospheric and systemic rather than graphical. A more rendering-intensive engine such as Unreal Engine would have introduced unnecessary overhead without a corresponding benefit to the prototype’s intended output. Godot Engine was considered as an alternative, but the team’s limited familiarity with it would have introduced additional risk during an already constrained development period. Unity was therefore selected as the most practical and time-efficient foundation for building *Haunted Hollow*.

5.1.1 Manager System

In order to establish a scalable and structured software architecture, we implemented a singleton-based manager system for the prototype. This approach allowed global access to key systems while maintaining centralised control over core game data. Within this structure, different managers are responsible for handling distinct categories of data and functionality, ensuring separation of concerns across the project. One of the primary components is the Game Manager, which acts as a central hub for distributing and maintaining shared game data throughout the experience. It is also responsible for tracking changes to important variables and ensuring that updates are consistently reflected across relevant systems. In addition, the manager system governs when certain functionalities are available and how other scripts can access and interact with them, effectively coordinating communication between otherwise independent systems.

5.1.2 Chat & Donation System

During this stage of the prototype, the Chat System was integrated directly into the Chat Manager, which handles its core functionality and runtime behaviour. At this point in development, the system operated under a sin-

gle “casual” theme, meaning that the chat consistently simulated a neutral livestream audience regardless of in-game progression or events. The chat functioned through timed intervals that generated messages at random by selecting from a pool of 50 predefined users, each associated with five possible comments. This interval-based structure was designed to reinforce the presence of an active livestream audience, continuously reacting to gameplay events and contributing to the overall pacing and atmosphere of the experience. The interval timing was also configurable through the script, allowing the frequency of chat messages to be adjusted and balanced within the modular structure of the prototype.

The Donation System was implemented using a trigger-based structure, where collider volumes defined specific activation zones within the level. When the player entered one of these trigger areas, a donation event would be executed. During this stage of development, the system was used only once towards the end of the experience, where the triggered donation functioned as a sudden interruption intended to surprise the player and reinforce the livestream-inspired framing of the prototype. Although limited in scope at this stage, the system established the foundational structure for future donation events, including the potential for varied trigger conditions, contextual responses, and progression-based gameplay effects.

5.1.3 Level System

In order to create the illusion of an endless corridor, we needed to address how continuous forward movement could be represented within a limited physical level space. Two primary solutions were considered: either simulating continuous player movement through a moving environment, or implementing seamless transitions between predefined level segments. Due to the time constraints of the project and the need for a reliable and controllable solution, we opted for the latter approach, prioritising stability and modularity over more complex environmental simulation techniques.

The implementation of this seamless traversal system is handled through a single script, *Teleportation*. This script controls both the timing and destination of player transitions between different sections of the level. It also receives a teleportation count from the Game Manager, which is used to determine the player’s current progression state within the experience. Based on this count, the system decides which segment of the corridor the player should be moved to next, effectively cycling them through a sequence of modular environments while maintaining the illusion of continuous forward movement. This approach allows us to reuse level sections efficiently while still preserving the intended linear progression of the experience.

The concept of seamless teleportation and segmented level traversal is inspired by games that manipulate spatial continuity to create illusions of extended or non-linear environments. Examples include *Superliminal by Pillow Castle*, 2019, which plays with perception and spatial consistency, as well as endless runner-style games such as *Subway Surfers by Kiloo Games*, *SYBO*



((a)) Subway Surfers



((b)) Superliminal



((c)) Platform 8

Figure 25: Spatial continuity inspirations

Games, 2012, where environments are continuously cycled to simulate infinite progression. Similar design principles can also be seen in anomaly-based horror titles such as *Platform 8* by KOTAKE CREATE, 2024, where repetition and subtle environmental variation are used to create unease and uncertainty. These references informed our decision to use teleportation as a means of maintaining linearity while still creating the perception of an extended, uninterrupted space.

5.2 Design Challenges

5.2.1 Aesthetic

Visual aesthetics are a fundamental component of horror as a medium, and as established in the prior analysis (see Section 2), the works most relevant to this project are characterised by deliberate and considered visual language. Atmosphere and tension in horror are constructed as much through image as through narrative or mechanics, and the prototype sought to reflect this. [3.5pt]

The visual direction pursued for Haunted Hollow drew on the language of analogue degradation: lens distortion, grain, and dithering, a technique that introduces controlled visual noise reminiscent of degraded film or low-resolution display. This choice was motivated by the game’s livestream premise and its corridor structure, where a lo-fi, worn aesthetic would reinforce both the diegetic framing of the player character as an amateur content creator and the claustro-

phobic, disorienting atmosphere of the adit environment.

Halftone approach

For our initial attempt, we explored a [Halftone shader](#) approach in order to implement a custom camera filter with a static-like visual effect. This would have functioned well as a diegetic visual distortion, as it could indicate that the connection through the implanted brain chip is unstable or malfunctioning, reflecting its unintended use. Additionally, the shader could have been adapted to become progressively more blurred or noisy to represent the player's descent deeper into the adit and the resulting degradation of the signal. However, once implemented, the effect did not respond dynamically to in-game objects and instead functioned as a static image overlay, which conflicted with the intended sense of visual motion through the camera perspective. Due to these limitations, we ultimately decided to discard this implementation and move forward with an alternative solution.

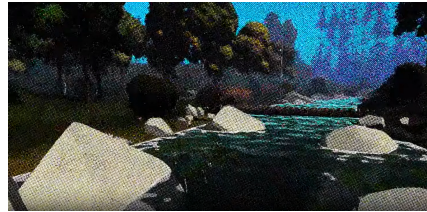


Figure 26: Example of Halftone visual by [Alexander Ameye](#)

Gamelogic FX Dithering

Following the challenges encountered with the Halftone shader and the time required to attempt its integration, we chose to prioritise implementation efficiency and switched to a pre-made solution. The asset selected was the [Gamelogic FX Dithering](#) shader, which was compatible with our Unity built version and had strong recent user reviews, indicating a stable level of reliability and support. This allowed us to continue development without further delays caused by custom shader limitations.



Figure 27: Example of Gamelogic FX Dithering shader by [Gamelogic FX](#)

Unfortunately, the reality proved to be the opposite. The shader did not function as documented, failing even when we attempted to load its bundled example scene. To determine whether the issue stemmed from our Unity version or from user error, we downloaded the exact version of Unity the shader had been developed in and ran the example scene again. It became clear that the shader was simply non-functional regardless of environment, and that resolving the underlying issue, if even possible, would be too time-intensive given our project schedule.

As a result, we made the decision to leave the visual aesthetics of the prototype as they were, prioritising the development of a functional MVP over further pursuit of the dithering effect.

5.3 Technical Challenges

5.3.1 Integrating LLM into the Game

As an initial concept for the chat system, we explored the possibility of integrating a Large Language Model (LLM) directly into the game in order to generate dynamic livestream-style chat messages during gameplay. This was implemented through *Undream AI*, which provided a package that could be integrated directly into Unity. The intention behind this approach was to create a more reactive and unpredictable chat experience capable of adapting to the player’s progression and surrounding environment in real time.

One of the first challenges encountered during implementation was the need to continuously provide prompts to the LLM whenever new chat messages needed to be generated. Prompts such as “Generate 20 Twitch-like comments for a channel exploring a haunted place. The context of the comments should describe the environment, which is a dark adit” were used to guide the generated output. Although this initially appeared to produce usable results, we quickly observed several recurring issues depending on the model being used. Many generated comments often shared similar sentence structures, repeated the same phrasing, or produced reactions that did not align with the context of the game. As a result, the system required constant prompt adjustments in order to maintain believable and varied chat behaviour. This became problematic from both a design and production perspective, as the consistency and contextual relevance of the generated comments could not always be guaranteed.

Another limitation emerged in relation to performance and responsiveness. While more advanced models were capable of producing more varied and contextually appropriate comments, they also demanded significantly greater amounts of RAM⁶ and computational resources. In addition, the response time of the models proved to be considerably slower than expected. This created issues for the pacing of the livestream simulation, as comments could not be generated quickly enough to match the intended flow of interaction. Since livestream chats on platforms such as Twitch or YouTube are typically fast-moving and highly

⁶Random Access Memory, which is required for the AI model to function.

reactive, the delay in message generation negatively affected the believability of the system and risked disrupting the player’s sense of immersion within the experience.

Due to the limitations related to performance, response speed, and prompt reliability, we ultimately decided to move away from the LLM-based solution and instead adopt a more controlled chat system built around JSON files. This approach allowed us to store large amounts of predefined chat data in structured arrays and lists that could be interpreted directly through scripts in Unity. By using JSON files, we gained greater control over the tone, pacing, and contextual relevance of the chat messages, ensuring that comments consistently aligned with the progression and atmosphere of the game. This also allowed the system to remain lightweight, predictable, and easier to iterate on throughout development while still maintaining the intended livestream aesthetic.

However, this implementation also introduced certain limitations. Because all comments had to be manually written, categorised, and adjusted, the workflow became significantly more time-consuming as the amount of data increased. Maintaining variation and contextual consistency across large quantities of chat messages therefore required extensive manual organisation and continuous refinement, which occasionally slowed the overall development process.

5.3.2 Chat & Donation System

As mentioned previously, the Chat System is managed through a dedicated Chat Manager responsible for handling the system’s core functionalities. These functionalities include controlling the timing intervals between chat messages, interpreting the JSON files used for data storage, and converting the stored strings into usable in-game data. The Chat Manager also handles the random selection process by choosing between a pool of 50 predefined users and subsequently selecting from the five possible comments assigned to each user. Combined with the modifiable JSON structure, this system allowed us to simulate the dynamic and reactive nature of livestream chats commonly seen on platforms such as Twitch and YouTube. By controlling the comments manually, we were also able to ensure that the tone and context of the chat aligned with the player’s progression and the intended atmosphere of the experience.

An alternative approach to the current implementation would have been the use of **ScriptableObjects** for data storage and organisation. **ScriptableObjects** could potentially provide a more structured workflow within Unity, particularly for larger-scale productions involving extensive datasets or multiple developers. However, for the scope of this prototype and within the context of a two-person development team, the practical differences between using **ScriptableObjects** and JSON files would likely have been minimal. As a result, we prioritised the simplicity, flexibility, and accessibility of the JSON-based approach.

The Donation System was implemented through a trigger-based structure designed to remain modular and reusable throughout the prototype. The sys-

tem operates using Unity’s collision and trigger functionality, where designated trigger areas detect when the player enters a specific space within the environment. Once activated, the trigger initiates a donation event that simulates the visual and auditory alerts commonly associated with livestream platforms and social media streaming environments. By designing the triggers modularly, the same donation behaviour could easily be reused across multiple sections of the prototype, helping to streamline development and improve workflow efficiency.

At the same time, the strengths of this implementation also introduce certain limitations. Since the system is entirely trigger-based, donation events can only occur within predefined locations unless additional functionality is introduced to support more dynamic activation conditions. Furthermore, each donation event requires both a collider and a trigger area to function correctly, meaning that the system remains closely tied to the spatial structure of the environment. Despite these limitations, the implementation was considered the most practical and time-efficient solution for the scope and structure of the prototype, particularly given the intentionally linear progression of the experience.

5.4 Initial Usability Playtest

5.4.1 The Purpose

For the initial version of the prototype, we primarily focused on testing the core mechanics and the overall feel of the environment. The purpose of this playtest was to evaluate how players experienced movement, camera control, pacing, and environmental traversal within the confined corridor structure. In addition to the mechanical aspects, the playtest was also intended to assess whether the atmosphere and spatial design of the environment were communicated clearly to the player. This early evaluation therefore functioned as a foundational step in determining how well the prototype aligned with the intended experience and identifying which elements required further iteration in relation to the overall objectives of the thesis.

The playtest was conducted through semi-structured interviews supported by a predefined test protocol designed to gather feedback specifically related to the feel of the mechanics, environmental design, and overall player experience. Following the interviews and gameplay sessions, the collected data was analysed using an Affinity Diagram method, which allowed us to cluster observations, identify recurring themes, and organise participant feedback into broader categories for further evaluation (Rachel Krause, 2024). This process helped structure the findings more clearly and provided direction for future adjustments and improvements to the prototype.

See Interview guide in Appendix 5

5.4.2 The Participants

The five playtesters were recruited through convenience sampling, drawing on existing acquaintances of the researchers. As such, the group represents a fairly narrow demographic: all five participants were male, ranging in age from 24 to 27. No personal data was collected during this process; the background information outlined below was known to the researchers through prior acquaintance, and all participants consented verbally to having their information included in this thesis.

Their professional backgrounds varied slightly: one worked as a web developer, one had no stated academic background, and three were students pursuing a Master's degree in games. This mix meant the group included both industry-adjacent professionals and people with a formal, academic understanding of game design.

In terms of gaming preferences, the group leaned toward action-oriented and complex systems-driven games. Genres such as RPGs, roguelikes, shooters, and strategy games appeared frequently across their profiles, with titles including Factorio, CS2, Slay the Spire 2, and Balatro coming up as recently played games. A couple of players also had experience with horror titles, including Resident Evil and Reanimator, suggesting at least some familiarity with the genre being explored in the prototype.

Attitudes toward walk simulators were generally neutral to cautiously positive. Most acknowledged they could be enjoyable under the right circumstances, particularly when supported by strong visuals, audio, or narrative, though one playtester noted he would typically avoid them for being boring. Responses to horror games followed a similar pattern: few were avid fans of the genre, but most were open to it or had some prior exposure. One notable exception was a playtester who actively avoids horror games due to finding them too tense, and another who only enjoys horror in a multiplayer context. This range of attitudes provides a useful spread of perspectives, from genre enthusiasts to relative outsiders.

5.4.3 The Data

The following Section presents the findings gathered from the first playtest session. The data was collected through post-playtest interviews and subsequently organised into an affinity diagram, grouping responses into pros, cons, and suggested improvements. The findings will be examined across two areas of focus: the movement mechanic and the environment, with each section drawing on the collective responses of the playtesters to identify patterns and points of improvement.

See Interview notes in Appendix 6

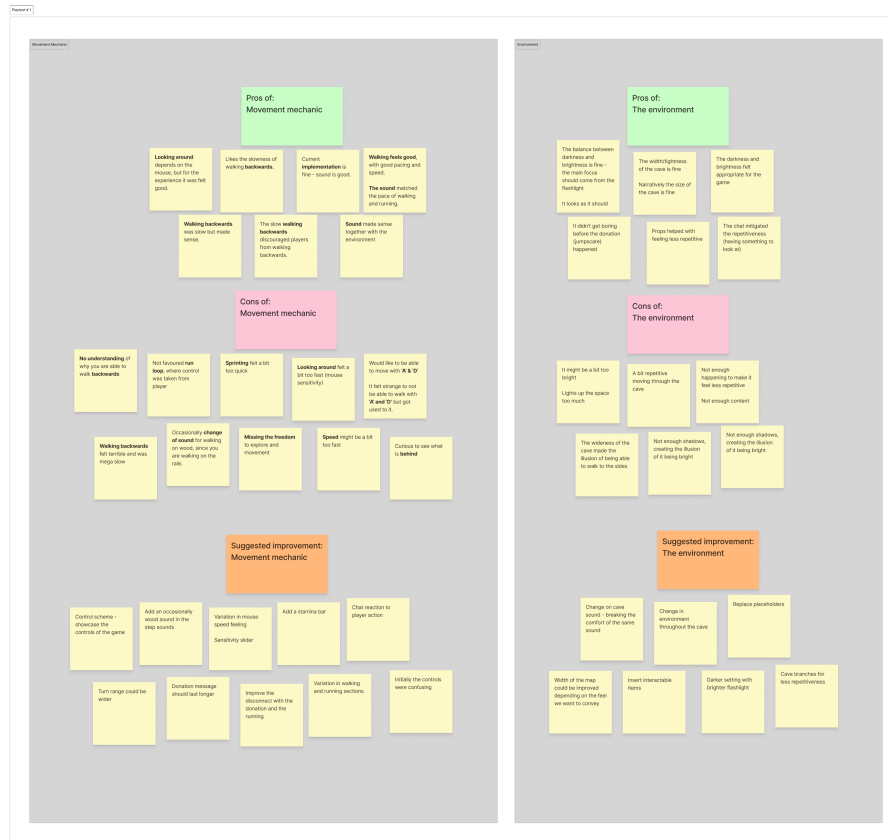


Figure 28: Affinity Diagram of the Initial Usability Playtest

Movement mechanic

The movement mechanic received a mixed but constructive response across the five playtesters. On the positive side, players generally found that walking forward felt good in terms of pacing and speed, and appreciated that the footstep sounds matched the rhythm of movement. Walking backwards, while notably slow, was largely accepted as making sense within the context of the experience. Looking around felt appropriate for most players, with one noting it was dependent on mouse sensitivity.

The criticisms were more numerous. Several players felt the sprint speed was a touch too fast, and looking around was similarly flagged as slightly too quick. A recurring point of friction was the restricted lateral movement, as the inability to use A and D keys felt strange to multiple players initially, though some adjusted over time. The run loop was also flagged as not being player-driven enough, with control feeling like it was taken away from the player. Other noted

issues included walking backwards feeling excessively slow, a curiosity about what lies behind the player, and a disconnect between the donation events and the run mechanic.

In terms of suggested improvements, playtesters proposed a range of changes including adding a stamina bar, a sensitivity slider, variation in walking and running sections, occasional wood surface sounds to break up the repetitive footstep audio, a wider turn range, and longer-lasting donation messages. Most notably, playtesters highlighted the need to address the disconnect between the donation system and the run loop, so that chat interactions feel more causally tied to the player character's physical responses, giving players a clearer sense that the audience's actions carry direct and legible consequence within the game world.

Environment

Feedback on the environment was similarly split. Players appreciated that the balance between darkness and brightness was largely fitting for the tone of the game, with the flashlight functioning as the intended focal point. The width and size of the cave was considered narratively appropriate by several playtesters, and props were noted as helping to break up the repetitiveness. The live chat element also helped mitigate monotony by giving players something to engage with visually.

On the negative side, the most consistent criticism was that the environment felt too repetitive, with not enough content or events to sustain engagement across the full experience. Brightness was flagged by multiple players, not because the space was too bright overall, but because the flashlight illuminated too wide an area, reducing the contrast between light and shadow and undermining the sense of atmosphere. The width of the cave also created a subtle but disorienting illusion that players could walk to the sides, which conflicted with the restricted movement system.

Suggested improvements centred on creating more environmental variety and tension. These included implementing a darker overall setting paired with a more focused, brighter flashlight, adding cave branches to suggest depth and increase suspense, inserting interactable items, introducing changes to the environment as the player progresses further into the cave, and replacing placeholder assets. Breaking the repetitiveness of the cave soundscape through ambient sounds like water drips was also highlighted as a way to prevent players from becoming too comfortable or complacent.

5.4.4 The Use of the Data

Overall, the playtest findings highlight two primary areas that require attention moving forward. In terms of movement, the core mechanics were broadly functional and received positively, however the experience would benefit from greater player agency, particularly in addressing the disconnect between the donation system and the run loop, as this was the most consistently noted point

of friction. Smaller refinements such as audio variation, adjusted sprint speed, and a wider turn range would also contribute to a more polished feel. Regarding the environment, the most pressing concern is the need for greater variety and progression, as the repetitive nature of the cave was the single most common criticism across all five playtesters. Prioritising a stronger lighting contrast between the flashlight and the surrounding environment, alongside introducing more environmental content and ambient sound, would go a long way in building the tension and atmosphere the experience is aiming for. Taken together, these findings suggest that the foundation of the game is sound, but that the next iteration should focus on deepening both the interactivity of the mechanics and the richness of the environment. More specifically, fine-tuning the movement as well as adding more interactions throughout the level and populating the level with props would help with improving the overall foundation of the current prototype.

6 Iterations

6.1 Design Description of Final Prototype

6.1.1 Level design

Building on the modular structure and object placement mapped out in Section 5.0.2, the final prototype saw the full implementation of the interactable objects, environmental decals, and narrative props into the built environment, see Appendix 7. The placement of interactable objects was designed to reward lateral attention without explicitly directing the player toward it, consistent with the forward-only movement structure of the adit. Rather than signposting interactions through conventional game design affordances, objects were embedded within the environment in a manner intended to feel discovered rather than presented. This decision was deliberate: in a space that otherwise withholds agency entirely, the presence of interactable elements was intended to introduce moments where the player’s attention and curiosity could produce a response from the environment, however small. (See Fig. 29 for Unity implementation)

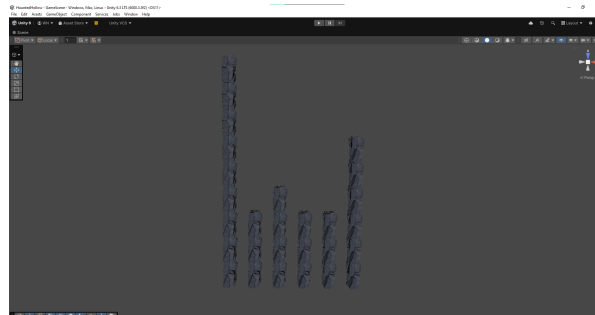


Figure 29: Implementation of structure in Unity

6.1.2 Stream UI

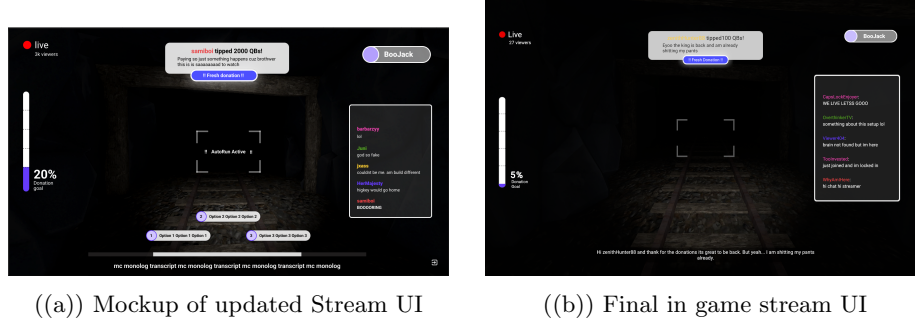


Figure 30: Iterations of stream UI

The stream UI underwent aesthetic refinement from its initial design, moving toward a more contemporary visual language consistent with modern livestreaming platforms such as Twitch and YouTube (see Figure 30). The core design intention remained unchanged from the principles established in Section 5.0.4.

6.1.3 Decision Wheel

The decision wheel connects (see Figure 31) to the player choice system established in Section 5.0.3, presenting item interactions as moments of consequential decision-making while the game’s outcome remains fixed regardless of selection. Rather than granting genuine agency, the choices are deliberately performative; they shape the streamer’s monologue and emerging personality without influencing the level’s linear progression.

This design draws on Mitchell’s observation that the most psychologically effective moments in constrained horror spaces are those that create *the perception of choice* rather than choice itself (Mitchell, 2015). These are structurally meaningless decisions that nonetheless produce meaningful pressure because the player does not know they are inconsequential. In this sense, the decision wheel operationalises what Murray identifies as the core condition of agency within digital environments: not unrestricted freedom, but the *felt* sense that actions carry weight within a designed system (Murray, 2016 ver.). Here, that sense of agency is deliberately simulated rather than genuinely realised.

This is consistent with Chen’s position that immersion in horror contexts is sustained through emotional engagement and anticipation rather than through mechanical consequence (Chen, 2025).

6.1.4 Chat Design

To make the simulated chat feel as authentic as possible, 50 unique user profiles were created, each containing five comments per JSON file. The JSON

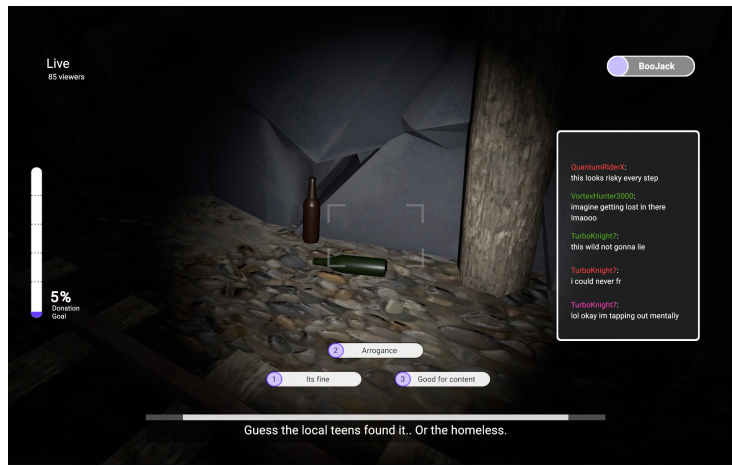


Figure 31: Decision wheel in game

files were categorised according to different emotional tones and contextual behaviours; for example, casual comments were stored in one file, while more wary or anxious comments were stored in another. The comments were written to span a range of tones within each emotional category. While the majority of messages were designed to directly reflect the intended emotional state of a given section, a subset were deliberately written in a more playful or provocative manner, drawing inspiration from the comedic, ironic, and trolling behaviours commonly observed within livestream audiences.

This included intentionally provocative remarks, humorous observations, and absurdist responses, all of which are well-documented characteristics of participatory online streaming communities (Hamilton et al., 2014). The inspiration for this tonal variation came largely from the team’s own experiences as viewers across a variety of Twitch and YouTube livestreams, which helped inform the overall voice, pacing, and authenticity of the simulated chat environment.

This design decision also carries a thematic function. The presence of irreverent and comedic comments alongside genuinely distressed ones mirrors the real dynamics of streaming audiences observed in works such as *“Deadstream”*, 2022 and analysed in the discussion of *“They Shoot Horses, Don’t They?”*, 1969 in Section 2.2.3. The audience does not respond to the player character’s deterioration with uniform concern. It continues to behave as audiences tend to behave, which is to say, inconsistently, self-interestedly, and without bearing the cost of what they are watching.

JSONs Files segmentation



Figure 32: JSON sections for the Chat and Donation System

6.2 Technical Description of Final Prototype

6.2.1 Game States

For the final prototype, we implemented a Game State system to manage the overall flow and structure of the experience. The system defines different states of the game, such as the Main Menu, Pause Menu, and active gameplay state, allowing the prototype to transition consistently between different parts of the experience. This structure was essential for organising the flow of the game and ensuring that different systems behaved correctly depending on the current state.

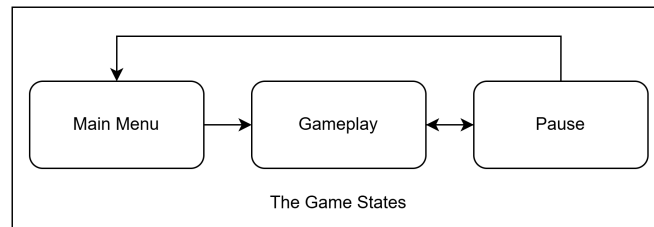


Figure 33: The Game States and how it traverses

By defining these states in advance, transitions between menus and gameplay could be handled more efficiently and consistently throughout development. Actions such as pressing the Escape key to pause the game, returning to the Main Menu, or starting the experience through the Play button were all managed through this centralised system. In addition to improving usability for the player, the Game State structure also simplified development by providing clearer control over when specific functionalities and interactions should be active within the prototype.

6.2.2 Chat System

The overall concept of the Chat System remained largely unchanged from the initial design; however, several extensions and refinements were implemented during development. With the introduction of thematic JSON files used to separate different categories of comments, the existing Chat Manager had to be expanded to correctly interpret and convert the JSON data into usable in-game

chat data. As a result, all chat comments are loaded at the beginning of the game, meaning the system only needs to determine when comments should change and which thematic category should be active based on the player's progression.

To support transitions between the different chat themes, we continued using the prototype's existing trigger- and collider-based workflow. This approach allowed the placement of chat transitions directly within the level, making it easier to control where thematic changes should occur and which type of chat should be activated. The trigger system operates through predefined states that determine which chat theme the Chat Manager should load, allowing the designer to configure the behaviour of each trigger simply by specifying the desired chat state, if they wish to do so. This structure also supported the modular nature of the prototype, as chat transitions could easily be repositioned or adjusted without requiring significant changes to the overall system.

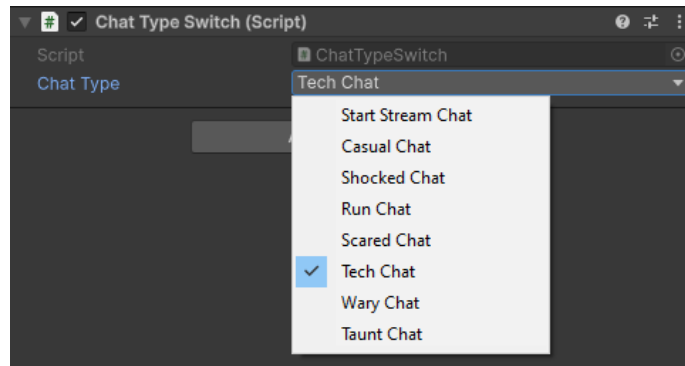


Figure 34: The Chat Switch system in Unity

In addition to these larger structural changes, several smaller adjustments were made to improve the overall readability and pacing of the system. The frequency of chat messages was increased to create a more active livestream atmosphere, while minor UI modifications were implemented to improve readability and make the chat easier for players to follow during gameplay.

6.2.3 Donation System

The Donation System remained largely unchanged from the initial prototype, as the usability playtest indicated that the core functionality already operated as intended. Most of the subsequent development therefore focused on smaller refinements and improvements rather than major structural redesigns. One of the primary adjustments we attempted was to create a stronger connection between one of the donations and the auto-run sequence, with the intention of making donation events feel more integrated into the pacing and progression of the experience.

Additional improvements were made to the visual presentation of the system. A cumulative invisible donation counter was added to the donation progress bar located on the left side of the interface, allowing players to continuously track the total amount of donations received throughout the experience. To support this functionality, the system calculates the total possible donation amount at the beginning of the game based on all donation events that may occur during progression. This value is then used to update the overall donation total dynamically as the player encounters donation triggers during gameplay.

6.2.4 Interaction System

A major addition to the final prototype was the full integration of the Interaction System into the gameplay experience. Although the foundational structure of the system already existed during earlier development, it was only after the initial playtest that the system became a properly integrated gameplay mechanic. The Interaction System functions by casting a *Ray*⁷ from the centre of the screen towards objects in the environment. When the ray detects an interactable object, the name of the object is displayed to the player. If the player presses the interaction button, the associated functionality of that object is triggered. Within the current prototype, these interactions are primarily used to activate monologue pop-ups.

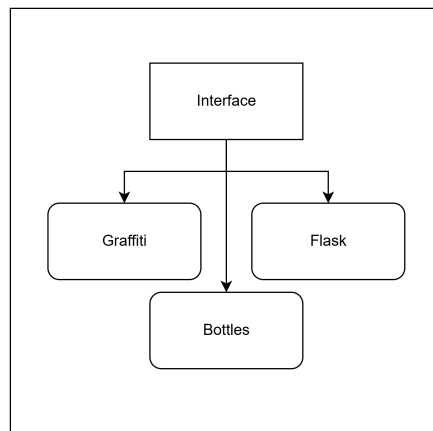


Figure 35: Example of the Interaction System structure implemented

The functionality of each interactable object depends on the specific script attached to it. This can be compared to interacting with an elevator button: the player recognises the button as interactable, and pressing it triggers a specific action depending on the selected floor. Similarly, our Interaction System uses Unity’s **Interface** architecture to standardise how interactable objects behave. A shared **Interface** defines the required interaction methods, while individual

⁷Imagine a laser being shot from the centre of the screen into the environment.

interactable objects derive from this structure and implement their own unique functionality. This approach allowed different objects to share a consistent interaction logic while still supporting varied behaviours depending on the context of the interaction.

By structuring the system around an **Interface**, we established a workflow that ensured future interactable objects would consistently contain the required interaction methods. This improved both scalability and maintainability during development, as new interactable elements could be added without restructuring the underlying system architecture.

An alternative approach could have been the use of **ScriptableObjects**, which are commonly used within Unity to manage reusable data structures and object behaviours. Such a structure could potentially simplify the creation of multiple interactable objects through shared data-driven configurations. However, we decided not to pursue this solution, as it felt unnecessarily complex for the scope of the prototype and would have required additional development time to properly learn and integrate. Instead, we prioritised a simpler and more familiar implementation that allowed us to maintain an efficient workflow and focus on completing the prototype within the project's time constraints.

6.2.5 Monologue System

The final major system implemented for the prototype was the Monologue System. This system was responsible for handling both the display of monologue pop-ups and the management of their associated text content. Similar to several of the other implemented systems, the Monologue System relied on colliders and trigger points to activate events throughout the level. However, unlike the Chat and Donation Systems, the monologue data required a different JSON structure and therefore needed a separate conversion process to properly interpret the stored dialogue data. Once converted, the data could be displayed within the designated monologue UI during gameplay.

Since the monologues were designed to progress automatically, timing became an important aspect of the implementation. The text needed to remain visible long enough for the player to comfortably read each line before transitioning to the next segment. To achieve this, the system utilised **Coroutines**, which provided a simple and efficient way to control timed text progression within Unity. This allowed monologues to unfold in sequence without requiring direct player input, helping maintain the pacing and flow of the experience while reinforcing the feeling of an ongoing livestream commentary.

One of the primary challenges of this implementation was balancing the timing and placement of monologue triggers throughout the level. If triggers were positioned too closely together, monologues could overlap, resulting in incoherent dialogue presentation or causing the system itself to break. This required extensive internal playtesting in order to fine-tune both corridor length and trigger placement. An additional complication emerged from the fact that monologues could also be activated through player interactions with environmental objects.

As a result, the system needed to handle both progression-based monologues and interaction-based monologues simultaneously without interrupting one another. To accommodate these timing constraints, certain sections of the corridor had to be adjusted in length to ensure sufficient space and pacing between dialogue events.

Alternative implementations were considered, including the use of existing dialogue or narrative packages available for Unity. Such systems may have simplified parts of the development process or provided more advanced dialogue management tools. However, we ultimately decided against this approach, as we could not guarantee that external packages would support the specific behaviour and pacing requirements needed for our prototype. Given the project’s limited timeframe and the fact that the current implementation already fulfilled the intended functionality, we prioritised maintaining a simpler and more controlled in-house solution rather than spending additional development time integrating and adapting third-party systems.

6.3 Scrapped Design

The following elements were cut during the final rescoping of the project. While both had been part of the initial design vision, unforeseen development issues, namely the visuals (Section 5.2.1) and the LLM (Section 5.3.1), compressed the available timeline and necessitated difficult prioritisation decisions. The criteria for deprioritisation were straightforward: any element that did not contribute directly to answering the research question was deferred to future iteration.

6.3.1 Feedback Loop

The original idea for the gameplay loop was to incorporate a feedback structure tied to the discovery or omission of interactable objects throughout the level. Successfully interacting with important objects would reward the player with increased donations and viewer counts, while missed interactions would reduce these rewards. This system was intended to create a stronger sense of consequence tied to player attentiveness, while also establishing a clearer gameplay loop and reward structure within the otherwise highly linear experience.

The idea was partially inspired by games such as *Platform 8* and other anomaly-based experiences, where identifying unusual environmental details functions as the primary gameplay objective. Similarly, our intended system aimed to encourage players to remain observant of their surroundings while reinforcing the livestream framing of the prototype through audience metrics such as views and donations.

Building on this idea, we also intended to display gameplay statistics at the end of the experience in order to provide players with an overview of their overall performance throughout the walkthrough. This feature would have further reinforced the feedback structure by presenting a clearer sense of progression

and consequence based on player actions.

However, due the prioritisation of the prototype’s core systems, these game-play extensions were ultimately not implemented into the final version of the prototype. Development instead focused on refining the primary experiential aspects of the project, particularly the environmental design, chat system, donation system, and overall progression structure.

6.3.2 Scare Event

The scare event idea was not fully scrapped, but the scare sequence was significantly scaled down due to the playtesting deadline. The original concept aimed to disrupt the player’s senses and sense of control: after a sudden sound cue, the player’s only light source would shut off, forcing them to navigate a completely dark adit, where unknown elements could appear or observe them. During this section, a donation event would trigger, compelling the player to move quickly through the darkness while uncertain threats and jump scares could occur.

Narratively, the loss of light was intended to destabilise the streamer character, leading to more erratic monologues as they attempt to maintain composure. At the same time, the relationship with the audience would intensify, creating an opportunity to further develop the dynamic between the streamer and the livestream viewers, particularly under conditions of heightened uncertainty and reduced control.

Due to time constraints leading up to playtesting, we implemented a simplified version of the scare instead. In this version, a sudden audio cue plays a voice telling the player “*Behind you*”, while the player is restricted from turning around. Although functional for testing purposes, this implementation lacks the intended buildup and could have been expanded into a more dynamic sequence. For instance, footsteps could have gradually approached from behind, or the player could briefly regain the ability to turn around and see nothing, only for an entity to appear elsewhere as they look forward again, creating a more controlled and impactful scare.

7 Evaluation

To evaluate how our prototype relates to our research questions, we designed an exploratory correlational user study. The goal was to identify which aspects of our confined, linear level design are most strongly associated with player engagement and involvement, and to define clear areas of focus for our analysis.

Our evaluation is grounded in Player Involvement Model (PIM) Calleja, 2011, which conceptualises involvement along six dimensions: *narrative*, *shared*, *spatial*, *kinesthetic*, *ludic*, and *affective*. Because no standardised instrument fully operationalises PIM, we adapted existing measures and mapped them onto Calleja’s dimensions ourselves. This mapping guided both the design of our

prototype and the structure of our evaluation.

7.1 Experimental Protocol

7.1.1 Theory

Our starting point is that constrained, linear spaces can still sustain engagement when they strongly support key dimensions of player involvement, particularly kinesthetic, spatial, narrative, affective, ludic, and shared involvement (Bódi, 2022; Calleja, 2011). We treat engagement as a multidimensional construct (cognitive, emotional, behavioural) that can be estimated using self-report questionnaires and in-game behavioural data, and in principle physiological measures (Rashed et al., 2025; Zhang, 2024).

Research on walking simulators suggests that low challenge and limited agency can nonetheless afford meaningful, contemplative play when narrative exploration and evocative environments are foregrounded (Thon, 2025). Audio design, including soundscapes, can further enhance immersion, affect, and enjoyment by strengthening spatial and affective involvement (Haehn et al., 2024; Hedges et al., 2024; Warde-Brown, 2021; Yang, 2025).

In addition, work on gamification shows that elements such as points, progress bars, and feedback can increase motivation, participation, and persistence when they are coherent with user goals and the overall experience (Jun and Lucas, 2024; Mazarakis and Bräuer, 2018; Meng et al., 2024; Xu et al., 2021). We therefore expect that carefully integrated gamification in a corridor-style space can partially compensate for restricted player agency by maintaining a sense of progress and purpose.

7.1.2 Constructs

Our evaluation focuses on two main constructs:

- **Player engagement** (cognitive, emotional, behavioural) Rashed et al., 2025; Zhang, 2024.
- **Player involvement** across Calleja’s six PIM dimensions, with particular emphasis on spatial, narrative, affective, kinesthetic, and ludic involvement Calleja, 2011; Calleja et al., 2016; Herrewijn et al., 2013.

These constructs are directly tied to our research main question:

How does confined, linear level design sustain engagement when player agency is severely restricted, and which specific design elements can compensate for the absence of meaningful choice?

7.1.3 Operationalisations and Variables

Table 2 summarises how we translate these constructs into observable in-game and self-report measures. In-game behaviour serves as a behavioural proxy for kinesthetic, spatial, and ludic involvement. Post-play self-report data primarily targets affective and narrative involvement, as well as overall engagement and perceived competence.

Construct / Aspect	Example Measures	Citations
Overall engagement	Total time spent, completion vs. drop-out, number and length of pauses; post-game engagement/flow questionnaire	Haehn et al., 2024; Rashed et al., 2025; Zhang, 2024
Kinesthetic / walk style	Frequency of stops, frequency of looking around (camera rotation), time spent stationary	Bódi, 2022; Calleja, 2011; Calleja et al., 2016
Spatial / level design	Time spent on side details, researcher notes on players seeking environmental cues	Calleja, 2011; Thon, 2025; Warde-Brown, 2021
Narrative / choice UI	Number of environmental elements acknowledged, self-reported reflection on UI text, self-reported narrative involvement	Bódi, 2022; Calleja et al., 2016; Herrewijn et al., 2013
Gamification (bars, numbers)	Self-reported motivation/enjoyment linked to these elements	Jun and Lucas, 2024; Mazarakis and Bräuer, 2018; Meng et al., 2024; Xu et al., 2021
Sound	Immersion ratings, qualitative comments about sound	Haehn et al., 2024; Hedges et al., 2024; Warde-Brown, 2021; Yang, 2025

Table 2: Key constructs linked to in-game and self-report measures.

7.1.4 Hypotheses

These hypotheses are based on our research questions and are only relevant in the context of testing. They do not attempt to answer our research questions directly but to help us evaluate them.

- **H1 (Overall engagement):** Players will report moderate to high overall engagement (cognitive, emotional, behavioural) despite the confined, linear level design.
- **H2 (Spatial and kinesthetic involvement):** Higher levels of spatial and kinesthetic involvement will be positively correlated with behavioural engagement indicators (e.g., exploration behaviour, time spent, low dropout).
- **H3 (Narrative and affective involvement):** Higher narrative and affective involvement scores will be associated with higher self-reported enjoyment and immersion.
- **H4 (Ludic and gamification elements):** Positive reactions to gamification elements (progress bars, numbers, feedback) will be associated with higher ludic involvement and perceived motivation to continue.
- **H5 (Design elements — exploratory):** In post-play interviews, participants will frequently attribute their engagement or disengagement to specific corridor design elements: stream UI, choice UI, gamification, level layout, walk style, interactions, and sound.

7.1.5 Study Design

- **Design:** Within-subjects, single-condition exploratory study.
- **Prototype:** Same game build for all participants; no condition manipulation.
- **Sampling:** Convenience sampling (friends, classmates, accessible players).
- **Data type:** Mixed-methods - qualitative interview, observation, and survey.

7.1.6 Methods and Materials

Materials

- Laptop with the game prototype installed.
- Screen and comfortable seating.
- Headphones (for consistent audio).

- Keyboard and mouse (kept consistent across participants where possible).
- Interview guide for the researcher (Appendix 8).
- Observation sheet for the researcher (Appendix 9).
- Post-play online survey (Appendix 10).
- Screen recorder software for the duration of the playtest.

Procedure

1. **Welcome and consent** — Explain the study purpose (testing how a walking-sim style corridor feels, focusing on engagement), and obtain informed consent and permission to record gameplay.
2. **Intro interview (pre-play)** — Ask participants what they usually play, how they feel about walking simulators, and how they feel about narrative games.
3. **Instructions** — Briefly explain that participants will play the prototype once. Emphasise: *“There are no right or wrong ways to play. The more you tell us the better. Please feel free to be as transparent as possible.”* Note that the researcher will observe quietly.
4. **Gameplay session** — Participant plays through the corridor level independently. Researcher observes and notes behaviours, audible reactions, and any visible confusion without intervening.
5. **Post-play survey** — Participant completes the questionnaire immediately after play, before any verbal discussion, to capture impressions before the interview can retroactively shape recall.
6. **Post-play semi-structured interview** — Researcher conducts the interview using the interview guide.
7. **Debrief** — Closing of the session and invites for final questions or comments.

7.1.7 Analysis

Our analysis addresses how a single constrained, linear corridor level can sustain player engagement when agency is severely restricted, and which specific design elements contribute most to that engagement. We combine three data sources:

- **Gameplay observation** provides behavioural indicators of kinesthetic, spatial, and ludic involvement (e.g., movement patterns, exploration behaviour, interactions with UI elements).

- **Post-play survey** provides self-report measures of overall engagement and involvement across Calleja’s six dimensions (PIM).
- **Semi-structured interviews** provide qualitative explanations of which corridor design elements (stream UI, choice UI, gamification, level layout, walk style, interactions, and sound) players perceived as engaging or disengaging.

Because all participants play the same prototype (within-subjects, single-condition), we do not compare between experimental conditions. Instead, we conduct exploratory correlational analyses to identify relationships between self-reported involvement across PIM dimensions, overall engagement (enjoyment, immersion/flow, willingness to continue), and behavioural proxies (time spent, exploration, interaction counts).

7.2 Data Collection

The ordering of data collection within each session was deliberate. Pre-play questions provided contextual information about participants’ prior experience while also functioning as a low-stakes opening to the session. The gameplay session followed without any think-aloud instruction, keeping the experience as close to a natural, unmediated play as possible, which is particularly important in a horror and atmospheric context where sustained immersion is both the object of investigation and a precondition for the kind of engagement being studied (Calleja, 2011; Chen, 2025).

The post-play survey was completed immediately after play and before the interview, ensuring participants recorded their impressions before verbal discussion could retroactively shape recall. There is a well-documented risk in qualitative research that interview questions, even neutrally phrased, can influence participant recollection (Saldaña, 2016); placing the survey first reduced this risk. The semi-structured interview was conducted last, as it was by far the most cognitively demanding part of the session, ensuring interview fatigue did not affect the quality of either the play session or the survey responses.

Several questions across the two instruments were intentionally designed to address the same underlying dimensions through different formats, Likert-scale items and open conversation. This overlap was analytical rather than redundant: it allowed us to compare rapid, isolated self-report ratings with more elaborated verbal accounts, and to treat convergence as confirmatory and divergence as a prompt for deeper interpretation.

7.2.1 Survey

The post-play survey captured self-reported experience across all six PIM dimensions and collected open-ended reflections on specific design elements.

Structure and Scoring

The survey comprised two parts. The first consisted of 23 closed-ended items distributed across the six involvement dimensions: four items per dimension for narrative, spatial, kinesthetic, ludic, and affective involvement, and three items for shared involvement, reflecting its reduced relevance in a single-player context. Each item was rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree), consistent with established practice in self-report experience measurement (IJsselstein et al., 2013). A seven-point scale was preferred over a five-point scale for greater response sensitivity and more reliable variance (Krosnick and Fabrigar, 1997).

The six dimensions and their items addressed the following:

- **Narrative involvement** — engagement with story and informational content, including curiosity about what would happen next, perceived meaningfulness of text and UI elements, felt narrative involvement, and care about the situation represented.
- **Shared involvement** — imagined social connection, including whether participants considered how others might experience the corridor, whether they could imagine discussing it, and whether they would recommend or share it. Items were framed around imagined rather than actual social interaction, consistent with Calleja’s treatment of shared involvement at the macro scale (Calleja, 2011).
- **Spatial involvement** — felt sense of presence within the corridor, including attention to environmental details, clarity of spatial orientation, and whether the environment invited active looking and exploration.
- **Kinesthetic involvement** — experience of movement and physical control, including enjoyment of moving through the corridor, naturalness and responsiveness of controls, whether participants varied pace or direction to explore points of interest, and engagingness of camera movement.
- **Ludic involvement** — sense of goals, purpose, and motivation, including whether participants felt they had tasks to work towards, whether progress indicators and gamification feedback gave a sense of purpose, motivation to continue, and attention to on-screen rewards and feedback.
- **Affective involvement** — emotional engagement, including whether the experience produced a felt emotional response such as curiosity, tension, calm, or excitement, whether audio contributed to that response, whether there were moments of particular felt immersion, and overall enjoyment.

Open-ended Items

The second part of the survey comprised three open-ended questions asking participants to identify what they found most engaging and why, what they

found least engaging or boring and why, and which specific design elements had the greatest influence on their experience. These responses were treated as an additional data source alongside spoken interview transcripts during coding.

Analytical Approach

Closed-ended responses were analysed descriptively, with mean scores and response distributions calculated per item and per involvement dimension. Given the small and non-random sample, no inferential statistical tests were applied and results are not presented as generalisable beyond the participant group. Scores were used to identify which involvement dimensions received the highest and lowest average ratings, and to flag individual items with notably high variance, an indicator that a design element was experienced very differently across players. These patterns were then brought into dialogue with qualitative findings from interviews and observations.

7.2.2 Semi-Structured Interviews

The semi-structured interviews were analysed using descriptive coding as a first-cycle method (Saldaña, 2016), assigning short labels to segments of data that summarise their content in plain terms, as closely as possible to the language used by participants themselves. The analysis was conducted at two levels: a group-level analysis examining patterns and convergences across the full participant set, and an individual-level analysis examining how codes and groupings manifested for each participant separately.

Group-level analysis

The coding process for the group-level analysis proceeded in three stages. In the first, each transcript was read in full before any codes were applied, in order to gain an overall sense of each participant’s experience. Codes were then assigned to segments where a participant referred to a specific design element, expressed a notable reaction, or described a shift in engagement or involvement. Each instance was retained as a separate code, including repetitions; frequency was treated as a preliminary indicator of relative salience, whilst recognising that a low-frequency code may nonetheless carry significant analytic weight (Saldaña, 2016).

In the second stage, the full set of codes was reviewed collectively across two team sessions. Codes were first sorted into provisional groupings based on apparent shared content, then revisited, debated, and either revised or confirmed, with each group receiving a descriptive category name. This collaborative process was intended to reduce the influence of any single team member’s interpretation (Saldaña, 2016).

In the third stage, codes within each category were arranged so that those addressing the same concept were placed adjacent to one another, allowing at-a-glance assessment of which concepts were raised most frequently. Each code was

colour-coded by participant to enable cross-participant tracking, which proved particularly valuable given the notably different player profiles and varying familiarity with the horror genre across participants. Where multiple participants independently raised the same design element in similar terms, convergence was treated as a stronger signal of its relevance. Where responses diverged, these tensions were retained in the analysis rather than resolved, as disagreement between participants can itself be analytically meaningful in an exploratory study (Saldaña, 2016).

Individual-level analysis

To complement the group-level findings, the codes produced during the first stage were additionally sorted and examined on a per-participant basis. Rather than identifying patterns across the group, this level of analysis organised each participant’s codes into groupings that reflected the structure of their individual experience. This allowed for a more granular reading of how specific design elements were weighted differently depending on the participant, and made it possible to identify cases where a finding that appeared minor at the group level was in fact prominent for a specific individual, or where a group-level pattern obscured meaningful variation between players. Given the small and heterogeneous sample, this individual perspective was treated as a necessary complement to the group analysis rather than a secondary concern.

A note on approach: This was the team’s first experience conducting and analysing qualitative interview data at this level of formality through coding. The coding process was approached with caution and conservatism, prioritising clarity and transparency over theoretical reach. The three-stage process was developed iteratively in response to the material, and the codes and categories should be understood as descriptive and exploratory in character rather than definitive claims about the data.

7.2.3 Player Data (In-Game Telemetry)

To supplement self-report data, in-game telemetry captured behavioural data continuously during each session. Unlike self-report measures, telemetry provides an unmediated record of player behaviour as it actually occurred (Drachen et al., 2013).

Four behavioural metrics were tracked: total time to complete the experience, number of complete stops, total time spent stopped, and total time spent moving backwards. Stop frequency and duration were treated as proxies for heightened attention or uncertainty; backward movement was treated as an indicator of disorientation or a desire to re-examine something previously encountered, given that the level provides no mechanical reason to move in that direction.

These metrics were not analysed in isolation but brought into dialogue with survey and interview data, allowing cross-referencing of self-reported experience with observed behaviour where relevant discrepancies or convergences arose.

7.2.4 Researcher Observations

During each session, a researcher observed and took notes on participant behaviour without intervening. Observations focused on audible reactions, visible signs of engagement or confusion, and moments where participants appeared to respond strongly to a specific design element. These notes were not treated as a primary data source but rather as a contextual layer informing the interpretation of survey scores and interview responses. Particularly in cases where a participant’s verbal account appeared to differ from their observed behaviour during play.

Observation notes were reviewed alongside interview transcripts during the coding process, and relevant observations were flagged where they added nuance or context to emerging themes.

8 Results

8.1 Participant Overview

The study recruited eight participants through convenience sampling, drawing from the researchers’ immediate social and academic networks. Six participants were students enrolled in the Games master’s programme at the IT University of Copenhagen, whilst the remaining two had no affiliation with ITU. All eight participants self-identified as active gamers, though they varied in genre preference and familiarity with horror and walking simulator experiences, as established through pre-play questions.

8.1.1 Anonymity of Participants

Given the convenience sampling approach, no formal recruitment procedure was followed and no written consent forms were administered. Participants were instead informed verbally of the study’s purpose prior to the session, and verbal consent was obtained for the use of their in-game telemetry data in the analysis. No personal data was collected at any point during the study; participants were not asked to provide their names, ages, or any other identifying information, and all session records were handled anonymously. This approach was consistent with the exploratory and low-risk nature of the study, where the data of interest was limited to gameplay behaviour and self-reported experience rather than personal or demographic information.

8.2 Findings

To make sense of the data collected across playtest sessions, we employed a mixed-methods analysis approach, combining qualitative and quantitative data from four sources: post-play surveys, semi-structured interviews, in-game telemetry, and researcher observations. Each source was treated as a distinct but complementary lens on the same experience, enabling triangulation across different modes of evidence rather than reliance on any single data type (Creswell and Creswell, 2018; Denzin, 1978).

The qualitative data from interviews and observation notes was analysed using the inductive descriptive coding approach described in Section 7.2.2. The quantitative data from surveys and in-game logs was treated as a source of descriptive and correlational evidence, capturing self-reported involvement across Calleja’s six dimensions alongside behavioural proxies for kinesthetic, spatial, and ludic involvement. Together, these sources were designed to address the thesis’s four sub-questions and to test the five hypotheses stated in Section 7.1.4. The findings are presented instrument by instrument below and synthesised in relation to the hypotheses in Section 8.3 and research questions in Section 9.1.

8.2.1 Survey Results

Taken as a whole, the survey responses were notable for their spread. Rather than clustering around a consistent range, responses varied considerably both within and between participants. At times spanning nearly the full width of the seven-point scale for items within the same involvement dimension. To make sense of this variation, the data was examined at two levels: first across the full participant group, and then on an individual basis.

Survey results can be seen in Appendix 11

Quotes from participants supporting the claims in Appendix 12

Group-level analysis

See group data results data quantified in Appendix 13

Dimension-level means were calculated by averaging item scores within each of Calleja’s six involvement dimensions. The results ranged from 4.17 (shared involvement) to 5.34 (affective involvement), with the remaining four dimensions falling between these values. Whilst affective involvement scoring highest is consistent with H3, which predicted that emotional and sensory engagement would be a primary carrier of the experience, and shared involvement scoring lowest aligns with expectations given the single-player context and simulated audience, the overall spread between dimensions is narrow. With a range of approximately 1.2 points across all six means, and given the small sample size, it is not possible to draw confident conclusions from the group-level data alone. The scores suggest a broadly moderate-to-positive reception across all dimensions, consistent with H1, but the proximity of the means limits what can be said about which dimensions were most or least effective as mechanisms of engagement.

Individual-level analysis

To account for the variation that the group mean obscured, responses were also examined individually, taking into consideration each participant's stated genre preferences, their self-reported interest in walking simulators and in narrative games as established in the pre-play questions. By the end of the playtest sessions, it became apparent that participants could be sorted into two broad groupings of approximately four each. The first group comprised participants who expressed interest in narrative games and were either already familiar with walking simulators or described broadly varied gaming tastes. The second group comprised participants who self-identified primarily as shooter genre players and reported little to no prior interest in or experience of walking simulators.

The expectation was that this grouping would produce discernible patterns in involvement scores, that participants more disposed toward narrative and exploration-led experiences would score higher on narrative, spatial, and affective involvement, whilst those less disposed would score lower across the board. This did not prove to be the case. Within each group, the dimension that received the highest involvement score and the dimension that received the lowest varied from participant to participant with no consistent pattern. There was no overlap within groups in terms of which PIM dimension dominated each individual's experience, suggesting that genre background and prior familiarity with walking simulators did not reliably predict which form of involvement the prototype produced.

This finding is itself meaningful in an exploratory context: it suggests that the prototype engaged participants through different dimensions depending on the individual, rather than producing a uniform experiential profile, and that the standard genre-based assumptions about player disposition may be less predictive in a radically constrained horror context than they are in conventional game experiences.

See survey individual evaluation and coding in Appendix 14

8.2.2 Interview Coding Results

The following Section presents the findings derived from the coded interview data. Where relevant, selected survey responses are drawn upon to supplement and corroborate the patterns identified across interviews, providing additional grounding for the claims made.

See interview notes Appendix 15

See survey individual evaluation and coding in Appendix 14

See group coding sorting process stage 1-3 in Appendix 16

Group-level analysis

The interview coding process produced 16 distinct thematic groupings across the full set of participant transcripts:

Shared Involvement

Consistent with the single-player structure of the prototype and the simulated rather than real audience, most participants reported that they did not think about other people while playing. The majority expressed a preference for solo play over playing alongside or watching someone else play the experience. A small number indicated some interest in discussing the experience with others after the fact, though this was not a dominant response. These findings align with the lower shared involvement scores observed in the survey results, and are consistent with Calleja’s framing of shared involvement as operating primarily at the macro scale in single-player contexts (Calleja, 2007a).

Streaming

A substantial number of participants described the stream UI as primarily decorative, indicating that it was visually legible as a livestream aesthetic but did not feel functionally integrated.

The survey data supports this reading. P02 wrote that they did not think they would *“react to the donation meter and viewer count] like I did to the chat”*, whilst acknowledging that both elements *“still contributed to the atmosphere”*. This response captures the decorative-but-present register the interview coding identified.

One participant (P07), however, reported feeling connected to the donation bar specifically, suggesting that the gamification element carried affective weight for at least some players even when the broader streaming framing did not register as mechanically meaningful. This is consistent with the confusion identified in the survey data around the functional role of the donation bar and its relationship to in-game progression.

“Felt Like Missing Something”

Across multiple participants, a recurring concern emerged around the sense that something had been missed during play. This manifested as uncertainty about whether environmental details, narrative cues, or interactive elements had been overlooked, and in some cases as a feeling that the experience contained more than the participant had been able to access within a single playthrough. Given the linear and non-branching structure of the prototype, this perception is notable: it suggests that the sequential delivery of content did not always feel complete or fully legible to participants as it was encountered, a finding that connects to the text and monologue issues discussed below.

“What Is the Goal”

Because participants were not given an explicit task prior to play, and because the prototype itself does not state a clear player objective, goal interpretation emerged as a significant point of variation across the participant group.

When asked to describe what they understood their goal to be, participants offered a range of responses: reaching the end or progressing through the corridor, following the narrative, performing as a streamer and raising donations, attending to the chat, witnessing something frightening, exploring the environment, or remaining uncertain about whether there was a goal at all.

This distribution of interpreted goals has direct implications for the ludic involvement dimension of *PIM* (Calleja, 2011). Where ludic involvement depends on the player's engagement with rules, goals, and a sense of purpose within the game system, the absence of a clearly communicated objective appears to have produced a fragmented goal structure in which different participants oriented themselves toward fundamentally different aspects of the experience. Rather than representing a failure of engagement, this finding may reflect the degree to which the prototype's deliberately constrained and rule-light structure invited participants to construct their own sense of purpose, with varying results.

Wants

Although the study was conducted from an academic standpoint rather than as a design feedback session, participants spontaneously expressed desires for future development of the project. The most frequently mentioned were requests for more content overall and for voice acting for the player character. Participants also mentioned wanting a greater number of choices within the experience and more pronounced or visually explicit environmental changes. These responses are noted here as contextual information rather than as evaluative findings, though they do indicate that participants were sufficiently engaged with the concept to project themselves into a more fully realised version of the experience.

Chat

The simulated chat system received overwhelmingly positive responses and emerged as one of the most significant design elements across the interview data. Participants described connecting to the chat in two distinct ways.

Behaviourally, several reported adjusting their in-game actions in response to chat messages, treating the simulated audience as a source of information or direction. This finding is corroborated by the open-item survey responses. P02 wrote that when the chat commented on sounds, they "*started paying more attention to the sounds*" - a direct reorientation of perceptual attention driven by the simulated audience. P03 similarly described using the chat as a guide for how to "*kind of feel or be aware of*" the environment.

Emotionally, participants described their affective state shifting in response to chat content, indicating that the system was capable of producing genuine emotional engagement despite its pre-scripted and non-reactive nature.

The chat was also identified as a source of entertainment in its own right, with participants expressing clear enjoyment of the simulated audience's pres-

ence. These findings are consistent with the design intention described in Section 4.2.8 and suggest that the chat system was the most successful single element of the prototype in sustaining player involvement.

The survey responses reflect both the strength and the ceiling of emotional involvement effect the chat had. P02 described the corridor markings and chat together as *"very creepy"*, while P01 found it *"interesting to see how people responded"*, though engagement dropped once the chat began to loop, pointing to the finite content of the scripted system as a natural limit on sustained emotional involvement.

Likes

The most frequently cited source of positive response within this grouping was the visual quality of the adit environment, which is notable given that aesthetic polish was among the elements deprioritised during rescoping.

Survey responses across multiple participants reinforce this. P04 described the corridor environment as most engaging because it *"made me curious as to what happened there"*; P06 wrote of being drawn forward by *"the darkness in front of me"*, with the bloody handprints and limited light source sustaining curiosity rather than resolving it; and P08 identified the voice and handprints as the moment of peak engagement. Together these responses show the environment performing its intended function: producing forward-directed curiosity through atmospheric suggestion rather than explicit event.

Beyond the environment, the chat system, the narrative content, and the sound design were also mentioned as elements that participants responded to favourably. The prominence of the environment as a source of appreciation supports the design decision to invest in the spatial and atmospheric qualities of the corridor, and connects to the spatial involvement dimension as a potential contributor to overall engagement.

This is further supported in the survey data by P03, who described how the corridor's drawings, scratches, and bloody hands prompted them to be *"more observant regarding my surroundings"*, and who expressed a desire to click on those elements, describing the crosshair as *"kind of reminding me of a camera focus"*. This suggests the curiosity the environment was designed to produce was present, but insufficiently directed toward the interaction system before it could establish exploration as a norm.

Text Being an Issue

The player character's monologue, delivered through on-screen text, was directly identified across multiple participants as a source of difficulty. Participants reported struggling to follow the text, particularly in the earlier sections of the experience, and described it as competing for attention with other elements of the prototype. Several participants noted that the monologue went unnoticed at the start of play, suggesting that its placement or timing did not

effectively draw attention. This finding is directly relevant to the design intention behind the monologue system described in Section 4.2.9, which emphasised voiced delivery as preferable precisely because it would reduce the cognitive load associated with on-screen reading. The absence of voice acting in the prototype appears to have meaningfully limited the system’s effectiveness.

Engagement

The chat system emerged as the dominant driver of engagement across this grouping, with participants identifying it as both an initiator and a sustainer of their involvement throughout the experience. The audit environment was identified as a secondary contributor to engagement, with participants describing the spatial qualities of the corridor as contributing to their attentiveness. Narrative content was also cited as a factor in maintaining engagement over the course of the playthrough.

In contrast, the auto-sprint mechanic was identified by the majority of participants as an engagement disruptor. The survey open-item responses give texture to this finding. P03 noted that the autorun *“took me more out of the story”* and disrupted their attention to the chat, a compounding effect in which kinesthetic disruption undermined engagement with a second system. P06 observed that prolonged walking *“felt sometimes like too much and that’s when the tension dropped”*, framing the mechanic as a pacing problem rather than an immersive one.

This finding connects directly to the design discussion in Section 4.1.2, where the auto-sprint loop was described as a mechanism for confiscating player control rather than restricting it. While this was intended to produce a specific affective response, the participant data suggests that for most players the loss of kinesthetic control produced disengagement rather than heightened tension, which represents a meaningful design finding in relation to Sub-question 3.

Overwhelmment

A notable and somewhat unexpected finding was that several participants described feeling overwhelmed at various points during the experience. This was attributed primarily to the volume and pace of on-screen text.

This is echoed in the post-play survey responses. P03 wrote that they *“focused so much on the chat and maybe felt a bit overwhelmed by the stream layer”*, pointing to informational competition between systems as the source of overload, rather than any single element in isolation.

Given that the prototype was designed around deliberate restriction and a reduced interaction set, the presence of overwhelmment suggests that the cognitive load associated with reading and interpreting text-based content may have counteracted the simplicity of the mechanical structure, producing a form of informational pressure distinct from the spatial and atmospheric pressure the design intended.

Emotions and Feelings

Curiosity emerged as the dominant emotional response across the full participant group, representing the most frequently coded emotional state and appearing overwhelmingly in positive form. This finding is consistent with the prototype’s design intention of sustaining anticipation and uncertainty rather than delivering direct horror events, and supports the theoretical position outlined in Section 3.4.2 that dread and sustained uncertainty can be more effective carriers of horror engagement than shock alone Perron, 2018.

Following curiosity, tension was reported in entirely positive terms, suggesting that the atmospheric and environmental design was successful in producing a sustained affective state without requiring direct threat. Boredom was also present, though in relatively small quantities, indicating that low-agency corridor traversal did produce some disengagement for a subset of participants without this being the dominant experience. Engagement, suspense, and anticipation were also represented, collectively describing an affective profile oriented toward forward-directed uncertainty rather than fear or distress.

Restriction Feedback

The majority of participants reported being broadly content with the level of restriction they experienced during play. However, this grouping also contained a notable split.

Survey responses illustrate the range of positions within it. P02 described how the limited controls *“contributed to feeling claustrophobic which was a great fit for the experience”*, an explicit positive reframing of restriction. At the other end, P05 wrote of hoping *“for more choices or something to change whilst walking”*, and P07 described walking straight as feeling *“slow and out of choice”*, indicating that the absence of agency was experientially present even where it was not strongly resisted.

This is further reinforced by the finding that participants overwhelmingly perceived their gameplay as having no influence on the game’s outcome, a perception that is factually accurate given the linear and non-branching structure of the prototype, but which was experienced differently across the group.

The movement restriction itself was received with general indifference, suggesting that the forward-only walk mechanic did not produce strong negative responses as a stand alone constraint. Taken together, these findings are directly relevant to the thesis’s central investigation of how restricted agency operates within a horror context, and support the theoretical position advanced in Section 3.3.1 that restriction does not necessarily reduce engagement, but that the perception of meaningful choice, or its absence, remains a relevant factor in how players experience constrained spaces (Chen, 2025).

Attachment

Participants generally reported low levels of attachment to the experience and in particular to the PC. The absence of voice acting and the difficulty associated with following the monologue text are likely contributing factors, as noted in the text discussion above. A small number of participants did report a degree of attachment to the story itself, suggesting that the narrative content of the adit's history was capable of generating investment even when the player character did not. This distinction between character attachment and story attachment is worth noting, as it suggests that the narrative layer of the prototype carried some independent weight despite the limitations of its delivery.

Donation

The donation event was consistently described by participants as a jumpscare.

The open survey responses corroborate this and add nuance. P05 noted that the superchat sound was *"kind of jump scary"*, while P06 grouped the donation sounds within the wider atmospheric soundscape, listing them alongside walking sounds and end-of-corridor whispers as primary influences on their experience. P05 further observed that while they liked *"the idea of interacting with the chat"*, *"it wasn't clear what my choices changed"*, pointing to the communicative opacity that the jumpscare framing reinforced.

While this was partially intended, the finding suggests that the donation mechanic was experienced primarily as a sudden disruptive event rather than as an integrated gameplay element with narrative or systemic significance.

Confusion

Participants expressed confusion around several specific elements of the prototype, most notably the functional purpose of the donation bar and the relationship between player input and the choice UI.

This is reflected in the survey responses. P05 articulated the mismatch directly: *"I like the idea of interacting with the chat. It wasn't clear what my choices changed though"*, a response that captures both genuine engagement with the concept and a failure of communicative legibility in its implementation.

In both cases, the confusion centred on a mismatch between what participants expected these elements to do and what they observed them doing. Given that both elements are central to the design intention of redistributing agency through the livestream framing, this finding suggests that the mechanical and communicative logic connecting the UI elements to the broader experience was not sufficiently legible in the prototype's current form.

Expectations

Several distinct expectation types were documented across the participant group, including an expectation of becoming spatially lost within the corridor, an expectation of experiencing fear or being frightened, and an expectation of jumpscare events. The presence of these expectations reflects both genre familiarity and the framing established by the prototype’s aesthetic, and in some cases created anticipatory tension that the prototype was able to capitalise on without necessarily delivering the expected event. Where expectations were not met, this produced responses that were sometimes experienced as disappointing and sometimes as relief, indicating that expectation management is a meaningful design variable within confined horror experiences.

Summary

The group-level interview analysis produced findings that were broadly consistent with the survey results whilst also adding qualitative depth to several of the patterns identified there. Across the 16 thematic groupings, a small number of themes emerged as structurally significant in relation to the research questions.

The chat system was the single most consistently positive finding across the full participant group. Its capacity to produce both behavioural and emotional responses, despite being pre-scripted and non-reactive to actual player input, represents the most clear-cut evidence that the livestreaming framing of the prototype was capable of generating genuine involvement. That participants adjusted their in-game behaviour in response to simulated chat messages, and that their emotional states shifted accordingly, suggests that the social dimension of the experience operated as a meaningful layer of engagement independent of the mechanical and spatial systems surrounding it. This finding connects directly to the affective and shared involvement dimensions of PIM (Calleja, 2011), and raises the question of how much further this effect might be amplified in a version of the prototype where the chat system was genuinely reactive to player behaviour.

The environmental and atmospheric design of the adit similarly received broadly positive responses, with visual quality, sound design, and spatial atmosphere cited across multiple groupings as contributors to engagement, tension, and curiosity. Curiosity itself emerged as the dominant emotional state across the participant group, appearing with a frequency and consistency that suggests the prototype was successful in its core design intention of sustaining forward-directed anticipation rather than delivering resolved horror events. The presence of tension and suspense as positive affective states further supports this, indicating that the atmospheric conditions of the corridor were capable of producing sustained dread of the kind Perron identifies as distinct from and more enduring than shock Perron, 2018.

Against these positive findings, several structural limitations emerged with comparable consistency. The on-screen text delivery of the monologue was identified across the majority of participants as either overwhelming, difficult to follow, or insufficient to hold attention independently. Given that the monologue system represents the primary vehicle for narrative delivery within the prototype, this limitation has significant implications for the narrative and affective involvement dimensions of the experience, and connects directly to the low attachment scores reported in relation to the player character. The auto-sprint mechanic similarly failed to produce its intended effect for most participants, reading as a disruptor of engagement rather than a transfer of bodily agency, and the functional logic of several UI elements, particularly the donation bar and the choice UI, was not sufficiently legible to participants to operate as intended.

The goal interpretation data and the confusion grouping together point to a broader legibility issue within the prototype. Where the design withholds a clear objective as a structural and thematic choice, consistent with the deliberate inversion of Mitchell’s horror loop model described in Section 4.1.2, the participant data suggests that this withholding was experienced by some players as ambiguity that productively sustained curiosity, and by others as a source of disorientation that undermined their sense of purpose. This split is itself a meaningful finding, suggesting that the degree to which goal ambiguity can function as a design tool rather than a design gap may depend significantly on individual player disposition and prior genre familiarity.

Finally, the low attachment scores reported across the group, particularly in relation to the player character, represent a limitation that the interview data consistently links to the absence of voice acting and the difficulty of the text delivery system. The small number of participants who reported attachment to the story rather than to the character suggests that the narrative content of the adit’s history carried some independent weight, and points to the possibility that a more effective delivery mechanism could have produced stronger narrative and affective involvement across the group as a whole.

Individual-level analysis

The codes produced during the group-level coding process were additionally sorted into groupings on a per-participant basis, allowing for a more granular reading of how the prototype was experienced across individual players.

The chat system was a positive presence for the majority of participants, functioning as a primary engagement driver for Testers 01, 02, and 04, and as a secondary source of entertainment for Testers 03, 06, and 07. Tester 05 presented the most ambivalent relationship with the chat, describing it as both meaningful and a disruptor of engagement, whilst Tester 08 found it disconnected due to its non-reactive nature.

The environment was the primary engagement driver for Testers 03, 06, and 08, and a strong secondary contributor for most others.

Sound was identified as the most influential element of the overall experience by Testers 02, 06, and 08, suggesting that the atmospheric and sonic design of the adit carried particular weight for participants whose engagement was less anchored in the chat or narrative systems.

Curiosity was present as a motivating force across all profiles with the exception of Tester 05, who reported little curiosity and whose primary motivation was completing the experience within the context of the playtest, and who explicitly stated they would have quit independently.

Tester 04 produced the richest individual coding profile, expressing investment across nearly all dimensions and indicating a desire to replay the experience. The survey responses for P04 are consistent with this breadth: the corridor environment was cited as most engaging for the curiosity it produced, audio was identified as the single most influential element, and P04 was among the three participants who unambiguously stated they would discuss the game outside the study, responding simply *"Yes!"*, the most emphatic response to that question across all eight participants.

Tester 08 presented the most critically oriented profile, identifying movement restrictions, text volume, and the modular repetition of the corridor as engagement killers, whilst still remaining entertained enough to complete the level. Their survey responses align with this coding. P08 described the corridor as *"straight and not very mysterious or creepy"* *"straight and not very mysterious or creepy"* and noted that the *"exiting parts were very brief and didn't feel connected or building up"*. Pointing less to any single element and more to a structural pacing problem in how moments of intensity were distributed across the experience.

Tester 07 was notable in having internalised the livestreaming premise as a genuine motivational frame, orienting their stated goal around witnessing something frightening for a simulated subscriber base and connecting personally to the donation bar. Their written survey response reflects this orientation directly: P07 described the most engaging aspect of the experience simply as *"feeling like a streamer was fun"*. A framing no other participant adopted as their primary orientation.

The auto-sprint mechanic was received negatively by Testers 01, 03, 04, and 06, who described it as breaking tension or immersion. Tester 05 was a notable exception. Their survey response confirms this and elaborates on it: where others experienced the sprint as an arbitrary loss of control, P05 found it the most engaging moment precisely because it introduced a legible cause-and-effect relationship: *"when the character started running and it was revealed that chat could control what happened, I was curious what that would lead to"*. This suggests the mechanic's intended effect was communicable in principle, but required a clearer causal signal than most participants received.

Text volume and delivery was a consistent limitation across the group, with the majority of participants reporting some degree of difficulty ranging from missing the opening of the monologue entirely to feeling overwhelmed by infor-

mation density.

Attachment to the player character was low across all profiles, though Testers 04 and 07 reported some connection to the story itself.

Summary

The most consistent finding was the prominence of the chat system as an engagement driver. Regardless of genre background, prior familiarity with walking simulators, or individual disposition toward the horror genre, the simulated chat was identified across nearly every participant profile as either the primary or a significant secondary contributor to sustained involvement. This convergence was unexpected in its strength and suggests that the social dimension of the livestreaming framing, even when simulated and non-reactive, carried considerably more experiential weight than the other systemic elements of the prototype. Curiosity was similarly consistent as a dominant emotional state, appearing across all eight participants and overwhelmingly in positive form, suggesting that the prototype was broadly successful in producing forward-directed anticipation even where other aspects of the experience were received more critically.

A second pattern concerned the reception of the auto-sprint mechanic. The majority of participants identified it as a disruptor of engagement rather than a contributor to tension, with responses ranging from confusion to boredom to a felt break in immersion. This represents a meaningful divergence from the design intention described in Section 4.1.2, where the mechanic was conceived as a mechanism for transferring bodily agency to the simulated audience. The participant data suggests that in practice the loss of kinesthetic control read as arbitrary rather than meaningful for most players, and that the causal connection between the donation event and the forced movement was not sufficiently legible to produce the intended effect. The survey responses add further evidence to this. P03 described how the autorun *"took me more out of the story"* and disrupted their engagement with the chat. A response that stands in contrast to P05, for whom the same mechanic introduced the only moment of clear cause-and-effect legibility in the entire experience, describing it as the point at which they became *"curious what that would lead to"*.

Text volume and delivery emerged as a third consistent pattern, with the majority of participants reporting some degree of difficulty with the on-screen monologue. This consistency across participants with otherwise very different profiles points to a structural limitation in the prototype's primary narrative delivery mechanism, and reinforces the design intention noted in Section 4.2.9 that voiced delivery would have been preferable.

Beyond these patterns, one of the more analytically interesting findings to emerge from the individual-level analysis was the degree to which participants contradicted themselves within their own accounts. These contradictions were not treated as errors in the data but as meaningful signals about the complexity

of the experience. Several participants described the chat as both entertaining and disconnected from the gameplay within the same interview. Others reported being content with the level of restriction whilst simultaneously expressing frustration at the absence of choices or the perception that their actions had no impact on the outcome. One participant described the stream UI as both a source of immersion breaking and as something that made the livestreaming premise feel real. These internal contradictions suggest that participant responses were shaped by shifting frames of reference across the interview, moving between evaluating the prototype as a game, as a research instrument, and as a concept with future potential, and may reflect the degree to which the experience was sufficiently novel that participants did not have stable prior frameworks through which to evaluate it consistently.

8.2.3 Player Data Results

All eight participants completed the experience. The minimum time required to complete the level without interacting with any elements and maintaining continuous forward movement is approximately five minutes, and the average completion time across the participant group was 6 minutes and 6 seconds, with the shortest recorded at 5 minutes and 7 seconds and the longest at 7 minutes and 45 seconds. The proximity of most completion times to the theoretical minimum suggests that participants did not spend substantial additional time engaging with environmental details or pausing to explore, which aligns with the interview finding that several participants felt discouraged from exploration or uncertain about whether there was anything to find.

The average number of stops taken was 30.125, with a high of 70 and a low of 4, indicating considerable variation in how participants navigated the corridor.

The average total time spent stationary was 56 seconds, suggesting that whilst stopping behaviour was present, it was not a dominant feature of any playthrough.

Backward movement was minimal across the group, averaging 5 seconds, which supports the interview finding that participants broadly accepted the forward-only directionality of the experience without attempting to resist or reverse it.

Taken together, the telemetry data indicates that the linear structure of the corridor was accepted rather than resisted across the participant group, consistent with the restriction feedback reported in the interview analysis.

Player data results and Observation results in Appendix 17

8.2.4 Observations Results

One of the more unexpected findings from the observation data concerned participant interaction with the environmental objects and interactables embed-

ded within the level. Out of eight participants, only one found and interacted with all available objects, and one additional participant interacted with a single object. This means that only one participant engaged with the prototype in the way the interaction system was designed to be used. This finding is significant in relation to the felt like missing something grouping identified in the interview analysis, where several participants reported a sense that they had overlooked something during play. The observation data suggests that in most cases this perception was accurate, and that the environmental objects were not sufficiently discoverable within the linear traversal of the corridor to draw participant attention without prior exposure to similar design conventions.

A notable pattern emerged in relation to exploration behaviour: participants who came into contact with an object consistently began looking around more actively thereafter, suggesting that the discovery of an interactable element recalibrated their understanding of the space as one that contained things to find. Participants who did not encounter any objects did not display this shift in behaviour, and largely continued moving forward without laterally scanning the environment. This points to a discoverability issue in the level design rather than a lack of curiosity on the part of participants, a reading supported by the interview data in which curiosity was the dominant emotional state across the group.

Playstyles could be broadly categorised into two types: participants who walked forward without deviation, and participants who occasionally looked around whilst progressing.

General body language across the group was engaged throughout, with several participants visibly reacting to chat messages, including audible chuckles in response to chat content. Frustration indicators were observed in three participants, all of whom had self-identified preferences for action-oriented games. However, when cross-referenced with the survey and interview data, as well as direct questioning during the session, none of these participants reported frustration explicitly, suggesting that the observed body language was misread by the researcher and should not be treated as a reliable signal of negative engagement for these individuals. Player data results and Observation results in Appendix 17.

8.3 In Relation to Our Hypotheses

H1 (Overall Engagement) *Players will report moderate to high overall engagement (cognitive, emotional, behavioural) despite the confined, linear level design.*

Broadly supported. Survey means ranged from 4.17 to 5.34 (based on Likert-scale) across Calleja’s six dimensions, curiosity was the dominant emotional state across all eight participants, and all participants completed the experience. Whilst boredom and frustration were present for some, neither represented a dominant response. Engagement was moderate to high across the group, though unevenly distributed across dimensions and individuals.

H2 (Spatial and Kinesthetic Involvement) *Higher levels of spatial and kinesthetic involvement will be positively correlated with behavioural engagement indicators (e.g., exploration behaviour, time spent, low dropout).:*

Partially supported. The adit environment was consistently mentioned positively for its atmosphere, visual, and sound design, indicating spatial involvement at a perceptual level. However, behavioural indicators were weak: completion times clustered near the theoretical minimum, backward movement and stationary time were minimal, and only two of eight participants interacted with any environmental objects. The predicted correlation between spatial involvement and active exploration behaviour was not clearly borne out.

H3 (Narrative and Affective Involvement) *Higher narrative and affective involvement scores will be associated with higher self-reported enjoyment and immersion.:*

Most strongly supported. Affective involvement produced the highest survey mean, and interview data consistently described curiosity, tension, and anticipation as positive affective states. Narrative involvement was constrained in practice by the monologue’s delivery failures rather than its content, with attachment to the player character remaining low across the group. The hypothesis holds at the affective level, with narrative involvement representing an area of unrealised potential.

H4 (Ludic and Gamification Elements) *Positive reactions to gamification elements (progress bars, numbers, feedback) will be associated with higher ludic involvement and perceived motivation to continue:*

Not supported in its current form. The donation bar was experienced by most participants as either decorative or mechanically opaque, and goal interpretation varied so widely across the group that no coherent ludic structure appears to have been communicated. One participant did report genuine motivational investment in the donation bar, suggesting the mechanism has potential, but as implemented it did not produce the anticipated association between gamification engagement and ludic involvement.

H5 (Design elements — exploratory) *In post-play interviews, participants will frequently attribute their engagement or disengagement to specific corridor design elements: stream UI, choice UI, gamification, level layout, walk style, interactions, and sound.:*

Supported. Across the interview data, participants consistently and spontaneously attributed their engagement or disengagement to specific corridor design elements, confirming that the elements identified in the hypothesis were experientially legible and distinct to participants. The chat system and sound design were the most frequently cited drivers of engagement, whilst the auto-sprint mechanic, on-screen text volume, and the communicative opacity of the donation bar and choice UI were the most consistently identified sources of disengagement. The stream UI was noted by the majority, though its reception was mixed, functioning as an atmospheric framing device for some and a source

of confusion for others. This distribution of responses across specific design elements confirms H5 and provides the primary evidential basis for addressing Sub-question 3.

8.4 What did we find?

8.4.1 Level Design

An issue that emerged during evaluation was that the level design itself may have functioned as a confounding variable in the results. As reported in Section 8.2.4, only one participant out of eight found and interacted with all available interactive objects, with a second interacting with only one. This means that the interaction system, which represented a primary mechanism for delivering narrative content and introducing moments of perceived agency within an otherwise heavily restricted space, was effectively absent from the experience of six out of eight participants.

What makes this particularly significant is a behavioural pattern observed among those who did encounter any element within the environment, whether an interactable object/decal or a non-interactable decal. These participants consistently began looking around more actively following the discovery, suggesting that finding anything at all recalibrated their understanding of the space as one containing things to notice. This is supported in the survey data by P03, who wrote that the corridor’s environmental details prompted them to be *“more observant regarding my surroundings”* and who expressed a desire to interact further with those elements. The fact that this instinct was present in P03’s survey response but did not appear to translate into sustained exploratory behaviour in the telemetry suggests that curiosity was produced but not effectively directed toward the interaction system.

Participants who went without encountering anything within a significant stretch of the corridor displayed no such shift, moving forward without laterally scanning the environment.

Crucially, the first two elements available to encounter in the level were both interactable objects, and only one participant found them. This suggests that participants conditioned themselves early on to move forward without exploring, meaning that the non-interactable decals discovered later by some participants were more likely the result of chance visual contact than active searching. The distinction matters: while several participants did encounter decals further into the corridor, this appears to have been incidental rather than intentional, and occurred only after the window in which the interaction system could have established exploration as a meaningful behaviour had already passed.

This points to a discoverability problem in the level design rather than a lack of curiosity on the part of participants, a reading supported by the fact that curiosity was the dominant emotional state reported across the group regardless of whether any objects or decals were found.

9 Academic Discussion

9.0.1 Worth Noting

Level Design

The implication as described in Section 8.4.1 is uncomfortable but worth stating directly: had the objects been more effectively surfaced within the corridor, the behavioural and involvement profiles of the majority of participants could have looked considerably different. Dimensions such as spatial, narrative, and ludic involvement, which scored more modestly in the survey results, may have registered more strongly had participants been meaningfully engaging with the content the level was designed to deliver. The findings therefore reflect not only how players responded to a confined linear corridor, but how they responded to a confined linear corridor from which most of the intended interactive layer was effectively invisible. That is a meaningful distinction when interpreting what the results can and cannot tell us about the research questions.

This caveat does not invalidate the data, but it does reframe several of the findings. The survey means for spatial, narrative, and ludic involvement are best understood as floor-level estimates of what these dimensions are capable of producing in this prototype rather than as representative measurements of the design's full potential. The affective dimension, which produced the highest mean, was less dependent on the interaction system and more directly sustained by the atmospheric and audio qualities of the adit environment, the simulated chat, and the pacing of the corridor, elements that functioned largely as intended. That the affective dimension held up under conditions where much of the designed interactive content went unseen is itself a meaningful finding, suggesting that atmosphere and social presence are robust sources of involvement even within a substantially degraded version of the intended experience.

Returning to the theoretical framing of this thesis, the situation connects directly to Mateas and Stern's argument that agency emerges from the coherent alignment between formal and material constraints Mateas and Stern, 2005. The interaction system represented a designed site of formal constraint (set of rules allowing the player to direct attention and receive narrative feedback) but its effective invisibility meant that this constraint was never meaningfully established. The result was that participants experienced the prototype primarily as a purely linear walkthrough, with agency structured only by the auto-sprint mechanic and the simulated chat. From this perspective, the low scores on ludic involvement are less a failure of the design concept than a failure of legibility: the system existed, but it did not enter participants experience in a form that could influence their engagement.

9.1 Discussion in Relation to the Research Questions

9.1.1 Main research question

How do specific design elements in a confined, linear corridor-style level influence players engagement and perceived involvement when their agency is deliberately restricted?

Receives a partial but substantive answer from the data. The finding that affective and shared involvement emerged as the most prominent dimensions, driven predominantly by the simulated chat and the atmospheric design of the adit, suggests that social presence and environmental immersion can function as primary engagement mechanisms within a heavily constrained space, even when mechanical interactivity is minimal or invisible. This supports the theoretical position advanced in Section 3.1.2, drawing on Chen (Chen, 2025), that immersion in horror contexts is sustained through emotional engagement and anticipation rather than mechanical consequence.

At the same time, the results complicate a straightforward endorsement of restriction as a sufficient design strategy. PIM (Calleja, 2011) provides a useful lens here: the model conceptualises involvement across six dimensions and the data reveals a pronounced asymmetry between them. Affective and shared involvement held up comparatively well; spatial and ludic involvement were weaker, with the nuance described above; narrative involvement was constrained by delivery failures rather than content failures; and kinesthetic involvement was actively disrupted by the auto-sprint mechanic for the majority of participants. Rather than the broadly distributed involvement profile the design intended, the prototype produced a narrower form of engagement concentrated in its social and atmospheric themes.

9.1.2 Sub-question 1

To what extent does playing a confined, linear corridor-style level lead to player engagement (cognitive, emotional, behavioural) despite low agency?

Receives broadly positive support from the data; all eight participants completed the experience, boredom was not the dominant response, and curiosity emerged as the consistent affective state across the group. This is consistent with research on walking simulators suggesting that low challenge and limited agency can afford meaningful, contemplative engagement when narrative exploration and evocative environments are foregrounded (Thon, 2025). However, the proximity of completion times to the theoretical minimum, and the near-absence of environmental exploration behaviour, suggests that the engagement produced was primarily passive and forward-directed rather than actively exploratory. The corridor sustained attention without generating the more invested behavioural engagement the design sought to produce.

9.1.3 Sub-question 2

How are players' reported involvement levels across the PIM dimensions (narrative, spatial, kinesthetic, ludic, affective, shared) related to their overall engagement in a confined, linear level?

This is difficult to answer definitively given the instrument's limitations, but the interview data offers useful qualitative texture. The chat system's capacity to produce both behavioural changes and emotional shifts in participants, despite being pre-scripted and non-reactive, is the clearest evidence that shared involvement operated as a genuine engagement driver. This connects to Calleja's framing of shared involvement as emerging from the sense of participating within a social context, even a simulated one (Calleja, 2011; Calleja et al., 2016). That the chat produced this effect without genuine reactivity raises the question of how much stronger the effect might be in a version of the prototype with a properly integrated responsive chat system.

9.1.4 Sub-question 3

How do individual corridor design elements (level layout, walk style, narrative/choice UI, gamification feedback, and sound) contribute to players' engagement and perceived involvement in this constrained space?

This produced the most granular findings. The audit environment's visual and acoustic qualities were consistently cited as contributors to spatial involvement and affective engagement, supporting the design investment in atmospheric qualities over mechanical density. The chat system emerged as the dominant single contributor to engagement across the participant group. Sound design, where specifically noted, was identified as the most influential element for a subset of participants. This is confirmed in the survey responses. P04 identified audio as the single most influential element; P06 listed the walking sounds, donation jumpscare, and end-of-corridor whispers as the primary shaping forces on their experience; and P08 named hearing the voice as their moment of peak engagement. Together these responses confirm that the audit's acoustic atmosphere carried significant weight for the participants most attuned to it. This is also consistent with research on audio design's role in strengthening spatial and affective involvement in immersive environments (Haehn et al., 2024; Warde-Brown, 2021). The auto-sprint mechanic, conversely, is the clearest case of a design element whose intended function, the transfer of kinesthetic agency to the simulated audience, operationalising Mitchell's concept of perceived choice Mitchell, 2015, did not translate into the intended experience for the majority of participants. The causal relationship between the donation trigger and the forced movement was not legible enough to produce the intended pressure, and the loss of motor control read as arbitrary disengagement rather than as a meaningful redistribution of bodily agency.

9.1.5 Sub-question 4

Which design elements most effectively compensate for the lack of meaningful choice, according to players self-reports and observed behaviour?

This has a clear answer in the data: the simulated chat system. Its performance as an engagement driver was both the most consistent finding across the participant group and the most striking in terms of its independence from genuine reactivity. That it compensated for restricted agency by providing a social frame within which the player's actions felt observed, contextualised, and responded to, even when they were not, aligns with Murray's observation that agency emerges through the perceived meaningfulness of actions within a designed system rather than through unrestricted freedom Murray, 2016 ver. The chat effectively simulated the conditions of meaningful agency without mechanically providing them.

The simulated chat system compensated for restricted agency by providing a social frame within which the player's actions felt observed, contextualised, and responded to, even when they were not. The survey data provides concrete examples of this effect. P02 began attending more closely to sounds after chat messages commented on them, and P03 described using the chat to calibrate how they *"should kind of feel or be aware of"* the corridor. In both cases treating the simulated audience as a genuine informational presence rather than a decorative layer.

9.2 Theoretical Implications

The findings carry several implications for the theoretical frameworks deployed in this thesis. Most directly, they complicate any straightforward claim that spatial and kinesthetic restriction is sufficient to sustain player involvement in horror experiences. The theoretical position established in Sections 3.1 and 3.4, drawing on Chen (Chen, 2025) and the spatial horror literature, holds that restriction intensifies attentiveness and emotional engagement by positioning the player in a state of sustained uncertainty. The data broadly supports this in relation to affective and atmospheric engagement, curiosity was the dominant emotional state, tension was reported positively, and the environmental design was cited as a consistent contributor to involvement. However, the data also reveals that restriction alone does not guarantee the forms of involvement most directly tied to player agency: the ludic dimension remained weak, and the kinesthetic dimension was actively disrupted for most participants.

This suggests that the theoretical relationship between restriction and involvement is more conditional than the existing literature sometimes implies. Restriction may intensify affective and atmospheric engagement reliably, but its effects on ludic and kinesthetic involvement appear to be more sensitive to the specific design conditions under which it is implemented. In this prototype, the two mechanisms most directly designed to modulate how restriction was experienced, the interaction system, intended to introduce moments of perceived

agency, and the auto-sprint mechanic, intended to redistribute kinesthetic control, which both failed to produce their intended effects for the majority of participants. The result is a situation in which the atmospheric conditions for sustained horror engagement were largely established, but the designed mechanisms for giving that engagement ludic and kinesthetic texture were either invisible or counterproductive.

The performance of the simulated chat system points toward a different theoretical implication. Calleja’s framework positions shared involvement as one of six co-present dimensions of player involvement, but the data here suggests that for this particular prototype, shared involvement functioned less as one dimension among equals and more as a structural load-bearing element, the dimension that held the experience together for participants whose engagement was not otherwise anchored in exploration, narrative, or ludic feedback. This may reflect the specific character of the livestreaming framing rather than a general property of shared involvement; the premise of being watched, evaluated, and responded to by an audience is a particularly powerful source of social pressure in contemporary media contexts, and the chat system leveraged that pressure effectively even in a pre-scripted form. Whether this effect generalises beyond the livestreaming conceit is an empirical question the current data cannot answer.

The individual-level contradictions documented in the interview analysis also carry theoretical weight. Several participants described the same design elements as simultaneously engaging and disruptive, or as both immersion-breaking and immersion-sustaining, within the same interview. Rather than representing inconsistency in the data, these contradictions are interpretable as evidence that participants were shifting evaluation frames, reading the experience alternately as a game, a research instrument, and a concept with future potential. This is consistent with the challenge of evaluating genuinely novel experiences, where prior frameworks for interpretation are absent or poorly fitting. It suggests a potential limitation in the use of self-report instruments for evaluating prototype experiences in emergent genres: where participants lack stable reference points, their accounts of involvement may be more reflective of the novelty of the framing than of the design elements under investigation.

9.3 Limitations of the Study

The most structurally significant limitation of this study is the one described in Section 8.4.1: the effective invisibility of the interaction system to six of eight participants means that the prototype evaluated differed meaningfully from the prototype designed. This is not a minor methodological inconvenience but a substantive constraint on the conclusions the data can support. Claims about how a confined, linear corridor-style level influences player engagement must be read with the understanding that, in practice, the level assessed was one from which a primary designed mechanism for modulating agency was absent for most participants. The findings are valid as a description of what participants

experienced; their validity as a test of the design’s intentions is more limited.

The absence of audio recordings from the playtest sessions and interviews, represents a second structural constraint. The codes produced during the interview analysis represent the researcher’s reconstruction of participant accounts rather than direct engagement with a verbatim record. This introduces interpretive distance that descriptive coding following Saldaña, 2016 is explicitly designed to minimise, a method premised on close, repeated engagement with participants’ own words. Without a verbatim record, the codes produced reflect the researcher’s reconstruction of accounts rather than the language of the data itself, which is the primary material descriptive coding works with. Saldaña notes that analytic claims rest most securely on patterned evidence across multiple participants; individual-level profiles are more vulnerable to the interpretive variation introduced when working from reconstructed rather than verbatim accounts (Saldaña, 2016). Accordingly, the group-level patterns identified across multiple participants are more reliable than the individual-level profiles, and should be weighted accordingly.

The sample size of eight participants is a further limitation. Whilst eight participants is not unusual for exploratory qualitative studies of this kind, it is insufficient to support strong quantitative claims about the survey data. The means and distributions reported in Section 8.2.1 are presented as descriptive indicators rather than as generalisable measurements, but the risk of over-interpreting small-sample survey data is real. The study is appropriately characterised as exploratory and hypothesis-generating rather than confirmatory, and the survey findings should be read in that spirit.

Finally, the adaptation of PIM-based measures developed for this study, in the absence of a standardised instrument fully operationalising Calleja’s six dimensions, introduces a degree of construct validity uncertainty. The questionnaire items were mapped onto PIM dimensions rather than derived from validated scales, which means the correspondence between measured responses and the theoretical constructs they are intended to capture cannot be assumed. This is a known limitation of research in areas where validated instruments do not yet exist, and it is acknowledged here as a constraint on the precision of the involvement measurements reported.

9.4 What went wrong?

9.4.1 Recordings and transcriptions

One of the more significant methodological oversights of this project was the absence of audio recordings from the playtest sessions and interviews. This was not a technical failure but a procedural one: the recording of sessions was never included in the research protocol, an omission that went unnoticed until data collection was already underway. This is in part attributable to the sessions being conducted by a single person, without a second team member present to catch the gap before it became consequential.

The effect on the findings is real. Descriptive coding following Saldaña, 2016 depends on sustained, close engagement with participants' own language across multiple coding cycles, both the initial coding and the subsequent recoding through which codes are refined, relabelled, and consolidated into categories. Without recordings or transcripts, neither cycle can be conducted with the fidelity the method requires. The codes produced represent the researcher's reconstruction of what was said rather than direct engagement with a primary record, introducing interpretive distance the method was designed to minimise across both passes. Claims of differences across individual participants are therefore difficult to verify, and the individual-level profiles presented in Section 8.2.2 should be read with this caveat in mind.

The practical lesson is that recording should be treated as a non-negotiable component of any protocol involving interviews, and its inclusion verified by more than one team member before sessions begin. Its absence here is a structural constraint on what the findings can claim.

9.4.2 The Level Design as a Complicating Factor

A related issue concerns the level design itself, discussed in detail in Section 8.4.1. That only one participant out of eight engaged with the interaction system as intended is not simply an evaluation finding; it is a problem with the research instrument. The interaction system was a core component of the design under investigation, and its effective invisibility to the majority of participants means that what was tested differed meaningfully from what was designed. Had the interactable objects been more discoverable, particularly the two placed at the opening of the corridor where they could have established exploration as a behavioural norm early in the session, the data collected may have looked considerably different.

The practical lesson here runs parallel to the one above: research instruments need to be verified not only for technical functionality but for whether participants can actually encounter and engage with them under real play conditions. A system that works correctly but goes unfound is, from a research perspective, a system that was not tested. Future iterations should treat discoverability as a prerequisite for inclusion in the evaluation rather than an assumption.

10 Workflow Discussion

Although we had collaborated on several prior academic projects, this thesis represented a considerably larger undertaking than anything we had attempted together. The following Section reflects on the challenges and adaptations that emerged over the course of the project.

10.1 Work process

10.1.1 Challenges

Rescoping

Throughout the course of this thesis, one of the more difficult lessons learned was the necessity of distinguishing between rescoping as a game designer and rescoping as a researcher. As a designer, the instinct is to protect the integrity of the experience, to ensure that what is built is not only functional but cohesive, atmospheric, and polished. In game design practice, rescoping typically means reducing scope while preserving that integrity, most commonly in the form of a Minimum Viable Product or, more precisely, a vertical slice, a self-contained segment of the game that demonstrates core mechanics, aesthetics, and player experience in a representative and playable state (Schell, 2008).

Letting go of that mindset proved to be one of the more challenging aspects of this project. Every decision to cut down a narrative point, leave a visual unpolished, or abandon an ambitious implementation felt, from a design perspective, like a compromise of the work. The dithering shader is perhaps the clearest example of this tension. Its absence mattered aesthetically, but it did not compromise the ability to investigate how corridor design elements influence player engagement and perceived involvement. That realisation, that the threshold for sufficiency in a research context is defined by the research question rather than by design ambition, required a fundamental shift in how progress and completeness were understood.

In a research context, a prototype does not need to be a fully realised game experience. It needs only to embody the variables under investigation well enough to elicit observable and reportable responses from participants. Elements that would be non-negotiable in a commercial or design-driven context, such as visual polish, audio completeness, or narrative coherence, may be deprioritised as long as the specific design elements being studied are present and functional. Learning to make peace with that distinction, and to trust that an incomplete experience can still be a valid research instrument, was one of the more significant personal and methodological developments of this thesis.

Main collaborating tool

Having collaborated on prior academic projects, we entered this thesis with an established working relationship and preferred tools to collaborate with. Early on, however, we found that daily work summaries generated unnecessary overhead for a two-person team. We transitioned to weekly sprints anchored by a Wednesday stand-up, in which we reviewed the previous sprint and set objectives for the current one. This rhythm proved better suited to our scale and pace.

A more significant disruption occurred mid-process when Notion revised its free-tier policies. As our primary platform for sprint documentation, source

management, and literature annotation, its sudden unavailability required an unplanned migration. We shifted these workflows to our existing Discord server, which, while not purpose-built for project management, allowed for rapid adaptation given our familiarity with the platform.

10.2 What could be improved?

One of the more straightforward improvements that could have been made prior to the evaluation was conducting a dedicated playability test of the prototype. Not a usability test in the formal sense, but a focused external check asking a simple question: *"Does the prototype play the way it was designed to?"* Had this been carried out before the evaluation sessions began, several of the issues described in the preceding Sections may have been identified and addressed in time. The discoverability problem with the interactable objects, which ultimately meant that the interaction system was absent from most participants experience, would likely have surfaced immediately under any form of structured observation. Similarly, the absence of audio recordings from the protocol may have been caught had the full session procedure been rehearsed in advance rather than assumed to be ready.

The practical lesson is that a playability check of this kind should be treated as a standard step between prototype completion and formal evaluation, distinct from the iterative playtesting that occurs during development. Its purpose is not to refine the design but to verify that what is being handed to participants is the prototype that was intended to be tested.

10.3 Future Works

While this project concluded as a thesis prototype, we intend to continue developing *Haunted Hollow* beyond its current scope. The following outlines the areas considered most critical for future iteration.

10.3.1 Level Design

The most immediate priority for future iteration is a thorough polish pass on the existing map, addressing visual and spatial inconsistencies that were deprioritised during development in favour of research functionality. Beyond polish, progression within the corridor warrants further development. The current design maintains a relatively uniform spatial grammar throughout; a more considered approach would introduce increasing environmental constriction as the player advances, with crevasses and narrow passages becoming more frequent deeper into the adit. This would reinforce both the narrative logic of the space and the escalating loss of player autonomy that the design seeks to produce.

10.3.2 Testing

A natural next step would be a follow-up evaluation conducted on a more complete and polished build. Such a study could reintroduce the interaction system in a form that participants reliably discover, and incorporate the audio and recording infrastructure that was absent from the current sessions. With those confounding factors resolved, a cleaner investigation of the core research question becomes possible, particularly regarding how corridor design and escalating spatial pressure influence perceived player involvement over the full arc of the experience.

11 Conclusion

This thesis set out to investigate how confined, linear corridor-based level design can sustain player engagement and perceived involvement in a horror game context when agency is deliberately restricted. The project produced *Haunted Hollow*, a first-person horror walking simulator structured around a single-axis mine tunnel, a simulated livestream audience, and a modified brain chip through which that audience exerts physical control over the player character's body. The prototype was evaluated through an exploratory user study with eight participants, combining self-report survey data operationalising Player Involvement Model (Calleja, 2011), semi-structured interviews, in-game telemetry, and researcher observations.

The central research question, concerning how specific design elements in a confined, linear corridor influence player engagement and perceived involvement under restricted agency, receives a substantive if partial answer from the data. The most consistent finding across all four data sources was the disproportionate contribution of the simulated chat system to player engagement. Despite being pre-scripted and incapable of genuine reactivity to player input, the chat produced both behavioural changes, with participants adjusting their attentiveness to sounds and environmental cues in direct response to chat messages, and emotional shifts, with affective involvement emerging as the highest-scoring dimension in the post-play survey. This finding aligns with Murray, 2016 ver. and her account of agency as the felt sense that actions carry weight within a designed system rather than unrestricted freedom: the chat effectively simulated the conditions of meaningful social responsiveness without mechanically providing them. That this effect was strong enough to function as the primary compensatory mechanism for restricted agency is, in the context of the thesis's research questions, the clearest and most generalisable result of the study.

The atmospheric and environmental qualities of the adit environment constituted the second most consistent positive finding. Curiosity was the dominant emotional state reported across all eight participants, and the spatial and sound design of the corridor was cited across multiple data sources as a contributor to tension, anticipation, and sustained forward-directed engagement. This supports the theoretical position of the thesis, drawing on Perron, 2018 and Krzywinska, 2002, that dread, understood as a sustained affective state produced by the anticipation of something that has not yet arrived, is a more robust carrier of horror engagement than shock, and that confined environments are uniquely positioned to sustain it through the management of visibility, sightlines, and acoustic texture. That affective involvement held up under conditions where much of the designed interactive layer was effectively invisible to the majority of participants suggests that atmospheric immersion is a resilient engagement mechanism, capable of functioning independently of the mechanical and narrative systems that surround it.

Against these positive findings, the study identified three structural limitations with direct implications for future development. The first concerns the

interaction system. Only one of eight participants engaged with the prototype's interactable objects as intended, meaning that the primary designed mechanism for delivering narrative content and introducing moments of perceived agency within the corridor was absent from most participants' experience. The implications for spatial, narrative, and ludic involvement are significant: the survey means for these dimensions should be understood as floor-level estimates rather than representative measurements of the design's full potential. The second limitation concerns the auto-sprint mechanic. Rather than producing the intended transfer of kinesthetic agency to the simulated audience, the mechanic was experienced by most participants as an arbitrary loss of motor control, reading as a disruptor of engagement rather than a meaningful redistribution of bodily authority. The causal relationship between the donation event and the forced movement was not sufficiently legible in the current implementation. The third limitation concerns the monologue system's reliance on on-screen text delivery. The absence of voice acting had a measurable negative effect on narrative and affective involvement: character attachment was low across the group, and several participants reported that the text competed for attention with other systems rather than enriching them.

Taken together, these findings complicate a straightforward endorsement of restriction as a sufficient design strategy for horror engagement. The theoretical relationship between spatial confinement and player involvement is more conditional than the existing literature sometimes implies. Restriction may intensify affective and atmospheric engagement reliably, and the data here broadly confirms this, but its effects on the ludic and kinesthetic dimensions of involvement appear to depend heavily on whether the designed mechanisms for modulating that restriction communicate their logic to players. Where those mechanisms are legible, restriction can produce the kind of psychological pressure Mitchell, 2015 identifies as the core of effective horror level design. Where they are not, restriction reads as arbitrary, and engagement drops accordingly.

The performance of the simulated chat system also carries an implication for Calleja's 2011 framework that is worth stating explicitly. Within the context of this prototype, shared involvement did not function as one dimension among six equals. It functioned as the structural load-bearing element of the experience, the dimension that held engagement together for participants whose involvement was not anchored in exploration, narrative, or ludic feedback. This may reflect the specific power of the livestreaming conceit in contemporary media contexts, where the premise of being watched, evaluated, and responded to by an audience carries social weight that other forms of shared involvement do not. Whether this effect generalises beyond the livestreaming frame is an empirical question this study cannot answer, but it represents a direction for future research.

The methodological limitations of the study, including the absence of audio recordings, the small convenience sampling, the effective invisibility of the interaction system to most participants, and the adapted rather than validated PIM instrument. These constraints limit the confidence with which the findings

can be generalised. The study is appropriately characterised as exploratory and hypothesis-generating, and its conclusions should be read accordingly.

Haunted Hollow, as a design concept and a research instrument, remains unfinished. The feedback loop, the dynamic scare sequence, the diegetic shader aesthetic, and the voice-acted monologue system were all deprioritised during development to preserve the research functionality of a time-constrained prototype. Future development will address the discoverability of interactable objects, the communicative legibility of the auto-sprint mechanic, and the acoustic design of the monologue system. A follow-up evaluation, conducted on a more complete build with audio recording infrastructure and a verified interaction system, would allow a cleaner investigation of the core research question across the full arc of the experience.

What this thesis establishes, within those constraints, is the following: a player confined to a single corridor without meaningful spatial choice can still be meaningfully engaged. The conditions for that engagement are not mechanical complexity or unrestricted freedom, but the coherent alignment of atmospheric design, social presence, and a designed sense that one's actions, however limited, are being observed and responded to. Horror, in this register, does not require the player to have power. It requires only that they feel watched and acknowledged.

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