The World Speaks: Best Practices in Environmental Storytelling

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Abstract

Environmental Storytelling within video games covers a wide array of practices and techniques. The purpose of this thesis is to research said practices, construct an artifact using the practices, and then test their effectiveness via playtests and surveys. Such practices include: Pull Design, White Space Storytelling, Slow Them Down, Put Them Where They'll Be, Staging Scenes, Aesthetic Language, and Semiotics.

1 INTRODUCTION

Every detail of an environment tells someone clues about what has happened there, who was there, how many were there, etc. It is a pervasive aspect of our lives that everyone participates in, regardless of how they feel about it. This is called "Environmental Storytelling."

Entertainment industries also make use of environmental storytelling. The games industry, in particular, often employs this concept. If, for example, the designer wanted to convey to the player that the character is lazy, they could attempt to recreate a messy room, unmade bed, and overflowing trashcan in that character's room in the level.

With the desire to communicate such ideas, video game designers have developed several methods to instil narratives into the environment effectively. The goal of this thesis was to compile these 'tricks of the trade' into a shortlist of best practices, use the list to construct a video game level, and test the efficacy of the methods.

2 TERMS DEFINED & THEORIES/RESEARCH

2.1 Environmental Storytelling

Being that environmental storytelling is as pervasive as it is, a sweeping, all-encompassing definition is difficult to relay. All definitions of it revolve around the same concepts, but none fully encapsulate it.

For example, NYU Narrative Design Professor Clara Fernàndez-Vara in her GDC 2012 talk describes environmental storytelling as, "Narrative Design at its purest" [1]. While the author of *Game Design: Theory & Practice,* Richard Rouse III, in their GDC 2010 talk, described it as, "What story the world would tell if the player wasn't even there" [2].

These various definitions all revolve around the connection between story and environment, but they don't necessarily give a definitive answer.

However, an answer that is more encompassing was from an article for *Game Rant*. In it, the author says that environmental storytelling is, "…allowing players to explore game worlds and draw conclusions from the structures, items, and other objects they discover, without having to resort to dialogue or chunks of written exposition" [3].

Or to shorten it, environmental storytelling is communicating ideas/stories to the player from the surrounding environment.

The practices found through research are most easily divided into two categories: Theoretical and Practical.

2.2 Theoretical/Conceptual Practices

A "theoretical" or "conceptual" practice is a trick or method that is best thought of before the actual building of a game level. They are concepts that are overarching and deal with things such as structure, narrative design, and level design as a whole.

Theoretical Practices consist of: Pull Design, White Space Storytelling, "Slow Them Down", and "Put Them Where They'll Be."

2.3 Pull Design [5]

In his 2016 GDC talk, Randy Smith, game designer for the series *Thief,* discusses the concept of Pull Design. Pull Design is the concept of designing stories that don't push the narratives onto the player. Rather, the player pulls the narratives from the environment and draws conclusions themselves. [5]

In a game such as *Bioshock*, the player isn't explicitly told either in dialogue or cutscenes what exactly happened to the underwater city of Rapture. Rather, the player is able to draw the stories out themselves from the environment through the use of prop placement, lighting, and framing of scenes.

If the player chooses to not pay attention to the story of the environment, they are not forced to experience it. Pull Design is the idea of allowing the player to discover the story themselves rather than outright telling them it.

2.4 White Space Storytelling [9]

White Space Storytelling comes from Harvey Smith and Matthias Worch's GDC 2010 talk. It is the idea of not telling the players the whole story, allowing them to fill in gaps themselves and come to their own conclusions.

A good way of visualizing this is thinking of a complete story as a circle. White Space Storytelling is erasing parts of the circle, handing it to the player, and asking, "what do you think?"

It's a practice that allows for interpretation, letting the player become a part of the storytelling process by letting them fill in the blank spaces.

It's important to note that, because of White Space Storytelling, as long as the conclusion follows a form of logic and includes the pieces presented to the player, virtually any conclusion the player comes to is valid.

2.5 Slow Them Down [2]

Richard Rouse III's "Slow Them Down" concept states that game designers should allow their players to wander around an environment. A simple concept, the logic is that if the designer forces the player to stay in one environment (either for a puzzle or a narrative reason), the player will be able to look around and soak in the micro-narrative more. With piece-finding puzzles (seen typically in *Silent Hill* games), this is doubly effective, as they're actively scanning the environment and paying attention to it.

2.6 Put Them Where They'll Be [4]

Justin Rodriguez, in his GDC 2018 talk explained that for *XCOM 2*, he realized the best place to put his micro-narratives were where the players typically visit. "High cover was priceless because we know players that were playing… would move from high cover as it was the safest bet in game...That is where I started putting all of my decoration and stories - around high cover," said Rodriguez [4].

If a designer places an environmental story beat behind a locked door in a tucked away hallway, most players will miss it. This placement is fine if the designer is intending for this story beat to be something the player discovers. Though, if they are intending for most players to see it, it would be better to have it in the hallway where the players must go to continue on the critical path. Once the level designer has implemented some of these Theoretical Practices, then they can begin to implement Practical Practices.

2.7 Practical Practices

A "practical" practice is a method that is best for when the designer is building the level. It's for deciding where to put the pieces, how to put them, and what they look like.

2.8 Aesthetic Language [6]

An offshoot of shape language, Miriam Bellard, Art Director for Visual Development at Rockstar Games, defines aesthetic language as the act of using hallmarks of styles to evoke the same imagery and draw comparisons.

In her 2021 talk, Miriam Bellard describes an "aesthetic" as a framework, and to identify the key aspects of that framework to be able to work within it. Some examples she uses are:

- The density of objects in the style
- The colours used in the style
- The shapes used in the style [6]

Aesthetic language is the way that people know that a classroom is a classroom, even if they have not been to that specific room; the type, orientation, and number of desks in the room is enough. If a room has enough aspects of an "aesthetic", then it will be linked to that aesthetic (and what that aesthetic means).

For this thesis, the researcher utilized key types of objects that exist within a specific style.

2.9 Semiotics

To put it simply, Clara Fernàndez-Vara defines semiotics as the study of signs and how people use signs to communicate ideas [1]. Knowing that a red octagonal sign is a stop sign or seeing a smoke plume and knowing that there's a fire at the source of it is engaging in semiotics.

Two specific forms of semiotics are **symbols** and **indexes**.

2.10 Symbols [1]

Symbols, in terms of semiotics, is an abstract image or idea that represents something. A stop sign is a symbol, the Bluetooth icon is a symbol, etc. Because these symbols are abstract, they must be taught and reinforced. In terms of environmental storytelling, symbols can be a very powerful tool. For example, Randy Smith in *Spider: Rite of the Shrouded Moon,* establishes early on in the game that the child character always leaves toys wherever they go. So, when the player discovers toys in a certain room, they can deduce that the child character was there at some point. Randy Smith calls this specific method a Calling Card, but the overarching idea is a symbol in semiotics.

2.11 Indexes [1]

Indexes is when something has a causal or situational relationship to another thing. Seeing smoke and knowing that fire is at is source is using the index of smoke to deduce that there is fire.

NYU Professor Fernàndez-Vara likens this practice to the player turning into a detective. The player must gather the remnants or 'clues' of what happened and put the story together using those pieces.

In terms of design, a way to think about indexes is by asking:

- What happened in the space?
- How has what happened left behind clues in the space? [1]

For example, in the game *Viscera Cleanup Detail,* the player is able to put together what happened before they arrived based on the bullet holes, scorch marks, and dismembered body parts thrown about.

2.12 Staging Scenes [9]

A 'staged scene' or 'vignette' is a moment frozen in time that the player is able to see and ingest from one frame. The culmination and inclusion of many of the other Practical Practices, it is typically a fully encapsulated story that has all of the pieces in view for the player to put together.

A game that does this well would be *Return of the Obra Dinn,* where the player is given the ability to see the exact moment someone dies when they interact with their body. With this, the designer is able to pack into one picture or moment an entire scene that the player can act out in their head.

3 LEVEL DESIGN PROCESS / METHODOLOGY

3.1 Overarching Narrative of Artifact

Using the outlined theoretical and practical environmental storytelling practices, the researcher drafted their design for a vault in *Fallout 4*. Vaults in the *Fallout* franchise were rife with environmental storytelling, as most of the fun of them was figuring out what had happened and, in most cases, why everyone is dead.

The artifact, "Vault 119," is a vault in which the researchers at the evil corporation, Vault-Tec, wanted to see what would happen if people lost the ability to communicate. The vault was built with two layers: the 'research' layer and the 'resident' layer. The research layer sat atop the resident layer, concealed from the residents below. The scientists, who inhabited the research layer, experimented on the residents below by slowly releasing a gas that eroded the language centre of the brain.

Inevitably, this led to chaos, as the residents' actions devolved into violence against one another. Eventually, the researchers were assassinated by Vault-Tec when they activated the robot security Protectrons to eliminate the researchers.

Using the practices listed above, the researcher set out to build the level's environment to communicate both this overarching story of the vault as well as the micro-narratives within.

3.2 Implementation of Theoretical Practices

"Slow Them Down", being the most accessible concept, was used heavily in the creation of the artifact. This concept can be seen through the use of puzzles in the artifact asking them to seek out specific objects within the vault in order to progress. This has the player combing through the environment more thoroughly, which in turn allows them to be able to notice and ingest more environmental storytelling.

"Put Them Where They'll Be" is best utilized through the terminal entries within the level. In the artifact, the player is asked to access terminals to unlock doors, access information, and grant themselves higher clearances to access more areas of the map. Within these terminals is additional information regarding both the overarching narrative of the vault as well as additional, supplemental information related to the residents. Due to the nature of Pull Design and White Space Storytelling, it is difficult to point to concrete examples of them within the artifact. Consequently, this analysis will focus on the Practical Practices, with references to the Theoretical Practices used.

3.3 Implementation of Aesthetic Language

The main branch of Aesthetic Language used in the artifact is the objects/props being used to decorate a room. While Aesthetic Language was used to construct this vault by analysing the architecture, lighting, and layouts of other vaults in the game, the highlights for using Aesthetic Language are the classroom, cafeteria, and library.

Figure 1: Classroom Image A [8]

The classroom has a plethora of school desks, all facing the same direction with blackboards along the wall. It has a single, larger desk with a terminal on it facing the smaller school desks. By these props alone, the room was able to communicate that it was a classroom without any words due to the similar layout commonly used in other classrooms.

Figure 2: Cafeteria Image A [8]

The cafeteria area had typical bench style seating with tables attached to them, a seating arrangement commonly seen in school cafeterias. In addition to this, the dimensions of the room were considered as well. Cafeterias commonly are wide in order to accommodate large groups of people. The floors are normally tile or some other smooth surface to allow for easy clean up should there be an accident. Because of this, the cafeteria in "Vault 119" is a wide room with a differently coloured tiled floor to add contrast to the space.

Figure 3: Library Image A [8]

The library, in addition to having a large number of books and bookshelves, is wide as well to accommodate large amounts of people. It has a warm wooden colour palette that it typical of most libraries as well.

By using these Aesthetic Language practices, the artifact is able to communicate what a room's purpose is quickly and without text.

3.4 Implementation of Semiotics

Both Symbols and Indexes are implemented in a number of ways in the artifact. In regards to Symbols, the researcher used gang paint colour splotches, which were intended to communicate the conflict of two rival gangs in the vault. The researcher also explored the use of Calling Cards in relation to a specific character (Anton Maslin). For Indexes, the researcher used bullet hole decals as well as ash piles, human remains after being killed by Protectrons (enemy robots that fire lasers in the game).

3.5 Implementation of Symbols

Figure 4: Gang Paint Image A [8]

Figure 5: Gang Paint Image B [8]

The gang paint colours, blue and yellow, are examples of Symbols within "Vault 119". They are abstractly connected to concepts (not inherently connected together) and have to be taught to the player. The researcher taught the gang symbols by placing two collages on the walls of either side of the vault (See Figure 4). On one side, it has a yellow paint mark, a blood splatter, and an arrow connecting the two. Below that mark is a blue paint mark, a check mark, and an arrow connecting the two. Inversely, on the other side of the vault, the collage has the colours swapped. This implementation is intended to teach the player that not only are there two rival groups, blue and yellow, but they are also in conflict with one another. This conflict can be seen in Figure 5 where the two gangs attempt to mark and claim territory within the vault.
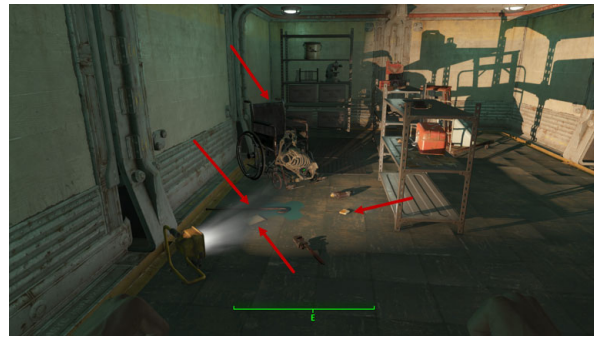

Figure 6: Anton Maslin Image A [8]

Anton Maslin's Calling Cards were the mobility aids that he needed to move around the vault. At multiple instances, vault documents as well as Maslin's room layout communicates to the player that Anton needs either a wheelchair or a cane to move. In addition to those objects, the key card and note next to his skeleton say his name on it. Because of this, when the player finds a skeleton with nearby mobility aids, they would assume it is Anton Maslin.

Again, because of Pull Design, this is not pointed out to the player, nor is it forced onto them. The player can walk by it and choose to not engage with it.

3.6 Implementation of Indexes

Figure 7: Ash Pile Image A [8]

The bullet holes and the ash piles are examples of Indexes within "Vault 119". When a gun is fired at an object, a bullet hole forms on said object. Therefore, bullet holes indicate that a gun was fired in that direction. When a creature is killed by the lasers of a Protectron, the creature turns into an ash pile. Therefore, ash piles indicate that a person was killed by a Protectron where the ash pile is located. These techniques are utilized heavily throughout the level in order to add to other aspects of environmental storytelling.

It is also important to note that because the researcher implemented both Pull Design and White Space Storytelling, the Symbols and Indexes are not directly addressed or explained via text, so the player can extrapolate them and come to different conclusions. The context surrounding these pieces heavily influences their interpretations.

3.7 Implementation of Staging Scenes

Because Staging Scenes is the most utilized Practical Practice within the artifact, this section will not touch on every staged scene within the level. Instead, this section

will analyse the most effective scene according to the feedback (more on this in the Data Analysis Section). It should also be noted that due to the nature of Staged Scenes, other Practical Practices will be referenced here.

Figure 8: Classroom Image B [8]

The scene within the classroom is a staged scene that utilizes many other practices in order to be effective. The scene has the player entering into a destroyed and disorganized classroom. In it, the desks appear to have been thrown around, there are ash piles littering the floor where desks used to be, a broken ceiling pane shows a room above with wires hanging down from it, a dead scientist lies directly beneath the broken pane, and a Protectron paces around the room scanning for 'more hostiles.'

Due to the utilization of Aesthetic Language, the first thing the player will notice is that this is a classroom. In terms of Indexes, the researcher has noted above how ash piles and the Protectron are causally linked and how the ash pile is an Index for 'someone was killed by a Protectron'. The player would deduce that the Protectron most likely killed the students and teacher. After this, the player would notice that hanging wires, broken ceiling pane, and the body of a dead scientist. This staging would indicate that the scientist and Protectron fell from the room above the classroom and landed in this space.

The story that the player would then be able to conclude is that the scientist and Protectron somehow broke the floor of the room above, fell down into the classroom (killing the scientist), and the Protectron wreaked havoc in a room full of people.

This room is able to communicate a fully encapsulated story due to the framing and placement of objects, Aesthetic Language, and Semiotics. However once again, because of Pull Design and White Space Storytelling, the player could just as conceivably either ignore this conclusion and not deduce the story or analyse the scene and come to a different (and equally valid) conclusion.

4   RESULTS & DATA ANALYSIS

For the purposes of this document, this section will cover the most and least successful aspects of the practices tested. This decision is the compare and contrast the differences of the successes and failures as well as keep this document brief.

The post-survey, which the 12 playtesters completed, contains a majority of open-ended questions. This structure was to encourage the testers to answer questions honestly without biasing them through the use of multiple-choice answers.

The issue this poses is that data analysis for this thesis was largely analysing statements and attempting to quantify them. To counteract this issue, the researcher will provide direct quotes from the participants as well as a brief analysis.
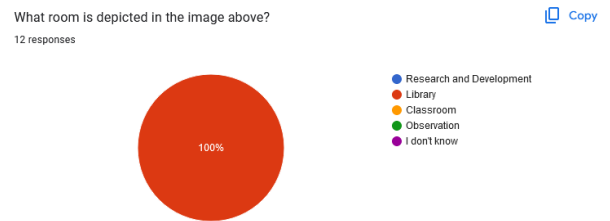
4.1   Results for Theoretical Practices

Theoretical Practices are difficult to both test and quantify effectively. Consequently, the survey results from the playtesters do not include the Theoretical Practices of Pull Design, White Space Storytelling, "Slow Them Down," and "Put Them Where They'll Be."

4.2   Results for Aesthetic Language

Figure 9: Library Image B [7]

Figure 10: Library Survey Results [7]

The library was the most effective room that utilized Aesthetic Language according to survey results. When presented with an image of the library, participants guessed with 100% accuracy as to what room was being shown. When prompted, the testers cited mainly the inclusion of books, bookshelves, as well as a terminal that labelled itself as the "Library Terminal". The warm color palette and inclusion of wood features were not referenced by the playtesters in their responses. In response to the question, 'Why did you select the room you did?', some responses include:

> "The series of bookshelves lining the walls"
>
> "Many bookshelves and also the terminal."
>
> "There are many books" [7]

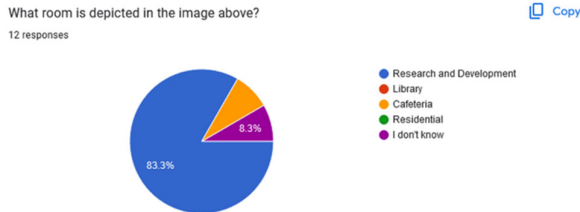**Figure 11: Cafeteria Image B [7]**

Figure 12: Cafeteria Survey Results [7]

The upper cafeteria was the least effective area that utilized Aesthetic Language, with only 8.4% of testers correctly identifying the room as a cafeteria when asked and 83.3% identifying it as "Research and Development". By looking at the survey results, the researcher can infer the reason for these results. Many testers cited that the "Research and Development" sign that appears on the doorway before the cafeteria was the biggest reason for their incorrect answer. This hints at the fact that players will trust signage and what they are told rather than what the Aesthetic Language of the room tells them. In response to the question, 'Why did you select the room you did?', some responses include:

> "The sign above the door"
>
> "I believe it says research area"
>
> "It's the second floor area where the research was mentioned" [7]

4.3 Takeaways for Aesthetic Language

Aesthetic Language can be a highly effective tool for Environmental Storytelling. While one example was largely a failure, the majority of the areas were correctly identified by the testers. Looking at the answers, the use of specific objects or props is the most effective aspect of Aesthetic Language.

It is important though to not have contrasting communication when using Aesthetic Language. Because Aesthetic Language normally doesn't utilize words or directly telling the player, players will trust signage or what they are told over the more subtle tool of Aesthetic Language.

4.4 Results for Semiotics – Symbols

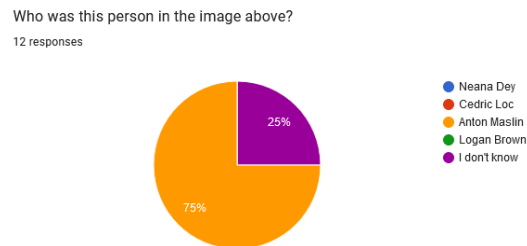**Figure 13: Anton Maslin Image B [7]**

Figure 14: Anton Maslin Survey Results [7]

The use of Calling Cards was highly effective in communicating that the skeleton, pictured in Figure 13, was Anton Maslin. Many testers cited mobility aids as well as the key card on the floor next to the skeleton as primary indicators of his identity. In response to the question, 'Why did you select the person you did?', some responses include:

> "wheelchair--movement assist"
>
> "The cane's in the room"
>
> "Because on the note it says this person can not move." [7]

Figure 15: Gang Paint Image C [7]

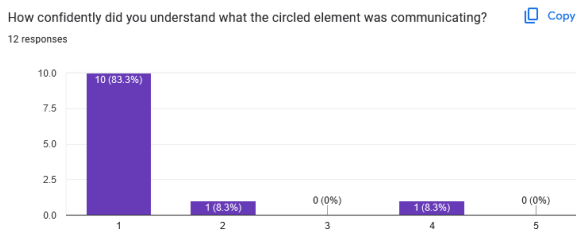**Figure 16: Gang Paint Image D [7]**

Figure 17: Gang Paint Survey Results [7]

The gang paint colours, however, were not effective communicators. Many playtesters cited that, although they saw the paint markings frequently throughout the vault, they didn't ascertain the meaning behind them. This includes the testers who saw the 'paint legends' on both sides of the vault. In response to the question, 'What do you think the circled elements where communicating?', some responses include:

> "totally no idea"

> "I thought they were just markings on the walls."

> "I have no idea what the circled element was communicating" [7]

4.5 Takeaways for Semiotics – Symbols

Symbols are effective when used to convey singular ideas or concepts. The failure of the gang symbols was the attempt to communicate many abstract ideas only using simple symbols. If the ideas were divided into more symbols and taught one by one, this application would have potentially been more effective. Conversely, the success of the Calling Cards for Anton Maslin was effective because the *only* thing the symbols were communicating was the presence of Anton Maslin in an area.

4.6 Results for Semiotics – Indexes

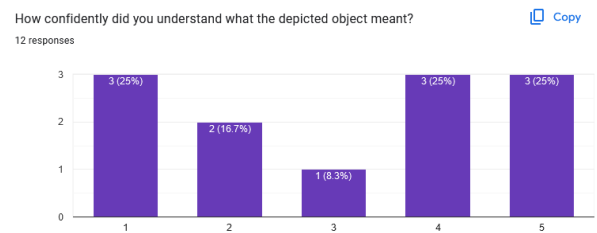**Figure 18: Ash Pile Image B [7]**

Figure 19: Ash Pile Survey Results [7]

Testers guessed correctly as to the meaning of the ash piles when prompted despite the confidence of the testers being spread out between 'very confident' and 'not confident'. In response to the question, 'What do you think the depicted object means?', some responses include:

> "I thought they were the disintegrated remains of people stuck in the vault after the protocol took place."

> "human remains, killed by bot"

> "The man/woman was burnt by the laser from the Protectron" [7]

4.7 Takeaways for Semiotics – Indexes

Indexes are effective only when the player engages with them logically and applies their reasoning to them. Due to the fact that, by their nature, indexes have a causal relationship to their connected concept, players must make that connection themselves in order for them to be effective.

4.8 Results for Staging Scenes

Figure 20: Classroom Image C [7]

Virtually every Staged Scene within the artifact was successful- save for one outlier. The classroom staged scene pictured in Figure 20 was the most effective, with every tester either being partially or completely correct when asked to state what happened in the scene. In response to the question, 'What do you think happened in this room?', some responses include:

> "the Protectrons killed the students during class"

> "the robot killed the children when the overseer did his protocol--whatever it was called"

> "I believe the Protectron got in here and incinerated all the kids with its laser."

> "The robot probably murdered everyone"

> "A robot was dispatched in order to kill the people in the classroom when things went south during the "clean slate"."

> "I believe that the Protectron killed all of the students"

> "The robot killed all the people in the classroom." [7]

Figure 21: Skeleton Shootout Image A [7]

The staged scene where two skeletons opposite of one another are holding guns pointed at the other shown in Figure 21 was the least effective according to the testing. With the 'correct' answer to the question, 'What do you think happened in this room?', being some form of the statement, "the two people shot each other", some responses include:

> "In a final stand, behind cover in the room they were confined to"

> "they probably died while hiding from the robots"

> "They got locked in this room and starved to death."

> "I have no idea how they died."

> "I have no idea I am sorry"

> "Killed themselves with pipe pistol"

> "I don't know." [7]

4.9 Takeaways for Staging Scenes

Staged Scenes by far were the most effective form of Environmental Storytelling within the artifact when correctly executed. Every Staged Scene was able to effectively communicate to the player a complex sequence of events using a combination of the other practices. The one outlier as show in Figure 21, after analysing it, has one crucial flaw: every piece of the scene was not able to be seen together from one perspective. Even from the image in Figure 21 provided, annotations had to be added in order for the image to be legible. Had the room layout been changed to allow for an easier time seeing all of the narrative pieces of the scene, potentially it would've been more effective.

5 CONCLUSION

After analysing the results from the research, implementation, playtesting, and survey, the researcher can conclude that these practices are effective in communicating stories via the environment. However, through this process, the researcher has discovered some caveats that should be noted for each Practical Practice:

- Aesthetic Language is powerful if not contradicted by other environmental aspects.
- A Symbol can only do so much by itself. To add more depth, either more Symbols or text is needed.
- Indexes require the player to logically engage with the causal object in order to understand it.
- Staged Scenes are powerful and able to communicate the most out of the practices tested, if done correctly.

To conclude, it is important to note that, while an environment can use these practices effectively and correctly in order to communicate vast and complex stories, they are only able to do so if the player chooses to pay attention to them. If a player decides to walk through an environment without pulling the story from it, the game should not punish them. This is why Pull Design, "Put Them Where They'll Be", and "Slow Them Down" were referenced and utilized in this thesis. In addition, in order to follow White Space Storytelling, if a player comes to a different conclusion after exploring and engaging with the environmental narratives, that is equally as valid as what the designer intended that story to be.

6 REFERENCES

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7 ACKNOWLEDGEMENTS