Best Practices: Using Semiotics in Environmental Storytelling

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Best Practices: Using Semiotics in Environmental Storytelling

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Abstract
This thesis explores an aspect of environmental storytelling known as “semiotics.” Semiotics conveys information and relevant interconnections to an individual through visual representations. There are diverse types of semiotic elements, including symbols, icons, and indexes. The researcher examined the use of semiotics in video games and derived seven best practices for conveying story beats and relaying aspects of a video game’s narrative. The researcher implemented these semiotic-related practices into a custom *Fallout 4* level, gathered testers to play the level, and asked the testers to give their opinions on the experience. The researcher analysed the tester’s feedback to conclude whether these best practices were truly successful or not.

Keywords
Level Design, Environmental Storytelling, Semiotics, Symbol, Icon, Index, Slow Them Down, Put Them Where They’ll Be, White Space Storytelling, *Fallout 4*

1 INTRODUCTION
Environmental storytelling is storytelling done through a space’s composition, including layout and object placement. Video game designers and developers utilize environmental storytelling in video games to help further emphasize and relay key narrative beats and critical information. This artifact focuses on “semiotics,” which is a visual aspect of environmental storytelling, including symbols, icons, and indexes. The researcher explored how to utilize these three elements to help players connect narrative fragments. These best practices were incorporated into the researcher’s level artifact, “Shelter ‘Ark’” in *Fallout 4* to test the effectiveness of semiotics in environmental storytelling.

2 TERMS DEFINED & THEORIES/RESEARCH

2.1 Environmental Storytelling
Environmental storytelling at a basic level is storytelling done through the environment. When it applies to an interactive medium, like video games, there are a lot of additional considerations and parameters. Several individuals have attempted to define environmental storytelling in regard to game development. In a 2010 Game Developer’s Conference (GDC) talk given by Harvey Smith (Arkane Studio’s Game Designer) and Matthias Woroch (LucasArts’ Lead Designer), the pair defined environmental storytelling as “creating a player-space with elements in the environment that can be interpreted as a meaningful story” [1]. Clara Fernandez Vara, NYU Narrative Design Professor, adds to Smith’s and Woroch’s definition by claiming that environmental storytelling allows players to explore and interpret narrative elements freely [2].

The researcher combined the various definitions and derived the following, common characteristics:

- The story is represented by objects or items that are placed in the environment.
- Objects placed in a specific space are narratively connected to form a scene.
- The player is not forced, but encouraged, to discover the story.

![Figure 1: BioShock](image)

In the video game *BioShock (2007)*, the player enters a ball room area early in the game. In the ball room, there is a tilted “Masquerade Ball” poster, a neon light sign saying, “Happy New Year 1959,” and a large earth statue, which has smashed through a nearby railing. These three objects suggest a possible story to the player. The ballroom was likely used to host a masquerade ball on New Year’s Eve in 1959. A large accident of some kind occurred, which interrupted the party and caused damage to the space. Since that day in 1959, the room has strangely not been repaired.

2.2 Theoretical Practices

2.3 White Space Storytelling [1]

Harvey Smith and Matthias Woroch also introduced the concept of “White Space Storytelling” in the same 2010 GDC talk. White Space Storytelling is when the designer...
allows or encourages the player to have their own, personal interpretation of a game’s story. Instead of having all the details pre-determined, like in an article or a movie, video game designers may place objects in such a way as to only communicate, or hint at, pieces of the story, thus allowing the player to fill in the narrative gaps themselves.

White Space Storytelling encourages the construction of an interactive narrative. The player not only reads the story but brings their own views and interpretation to complete the story. As a result, the story now “belongs” to the player. Each player will now have their own unique version of the story.

2.4 Slow Them Down [4]

Richard Rouse III, lead designer of The Suffering, originated the environmental storytelling concept known as, “Slow Them Down.” This concept relates to the practice of putting narrative objects near spaces in which the player must stay and investigate. In doing so, the designer encourages the player to look around the environment and engage with the story.

For example, in BioShock (2007), the player stumbles across a dead man nailed to a column. The column’s walls are repeatedly carved with the word “FIRED.” This man is in the middle of the player’s critical path. The player must travel through this space to progress in the game. As a result, the designer is guaranteeing that the player will see this environmental storytelling moment.

2.5 Put Them Where They’ll Be [6]

Justin Rodriguez, senior environmental artist on XCOM 2, mentioned that when he placed all the environmental storytelling objects, he tried to place them in commonly encountered player spaces. In other words, Rodriguez tried to “put objects where the player will be.” By placing key narrative information in locations that the player must visit for navigational purposes, the designer is able to ensure that players are more than likely going to discover environmental storytelling elements.

2.6 Semiotics

Semiotics is the study of signs. It explores how a sign’s meaning is defined, and how to effectively communicate this meaning to others [8]. In Clara Fernandez Vara’s 2012 GDC talk, “Environmental Storytelling: Indices and the Art of Leaving Traces,” Vara claims that there are two parts to “semiotics.” The first part is a “sign” or a visual image. The second part is the sign’s meaning [2]. For example, an image of a cigarette inside a red circle with a red bar across it is considered as a “sign.” The sign conveys the sentiment or meaning of, “no smoking allowed.” This cigarette sign communicates information to the player, allowing the player to derive meaning from it.

There are three types of semiotic elements: symbols, icons, and indexes.

2.7 Symbol [2]

Symbols are, “signs or shapes which are used to represent something else” [9]. In society, humans have created various visual symbols to universally convey/communicate a specific meaning. The “Stop” sign, a big hexagonal red sign with white lettering, tells drivers to stop at intersections. The sign has been adopted internationally and is now used in multiple English-speaking countries. Societally, the sign’s appearance is permanently tied to the concept of “stopping.” However, a standalone image does not have any meaning unless it is associated with an object or function. Symbols are abstract and need to be learned or defined.

In video games, symbols have a similar function. The designer must teach the player a symbol’s meaning. The player is then, subsequently, able to understand what this symbol is communicating.
A successful video game symbol would be the Lambda symbol in *Half-Life 2*. The Greek letter Lambda communicates nothing to the player by itself, but, in the game, the Lambda symbol is always next to extra pickup items and helpful resources. Early in the experience, an NPC character even tells the player to look for the Lambda symbol to get help. Throughout *Half Life 2*, the player repeatedly finds the Lambda symbol, with extra resources nearby. As a result, the player eventually associates this symbol with “positive rewards.”

In Griffin DeClaire’s thesis, *The World Speaks: Best Practices in Environmental Storytelling*, DeClaire implemented a series of yellow and green markers to show the existence of two gangs and how they conflict with each other. However, the symbols were found throughout his level in a variety of different contexts. Some green and yellow markers are on the floor, some are painted together on a wall, and some are blocking the doorways. Because the symbols are never explicitly defined, the player can interpret several different meanings. In his study’s test results, more than 83% of the testers were uncertain of the yellow and green markers’ meaning. Some responses include, “Totally no idea,” and “I thought they were just marking on the walls.”

An icon is a visual representation of an object or a scene. It conveys an idea by imitating or resembling it. Unlike symbols that need to be defined before they can have meaning; an icon allows the reader to understand its meaning instantly. When seeing a picture that has a shape of a key, the reader can immediately understand that the icon is a key, without having to see a real key object.

As seen in Figure 6, when the player picks up food, and sees the icon of a hambone in their inventory, it affords to the player that they now have food/meat. Because the hambone icon looks similar to hambones found in the real world, the hambone icon also affords that the player is able to virtually eat the corresponding digital food item. When the player eats the virtual food, the player character’s health points are restored. Food is sustenance both in the virtual world and the real world. The game does not need to teach the player of each icon’s meanings. The player understands it immediately when they see it appear on screen.

An index is type of sign that specifically connects or alludes to another element. The reader is not seeing this element directly. Instead, the reader sees the index, which implies the existence of the element. For example, when an individual sees a large amount of smoke, they immediately think there must be a fire nearby. The smoke (index) implies the existence of the fire (element).

In the video game *BioShock (2007)*, the player encounters several women’s photographs along a wall. Scissors stab through the eyes of the photographed women. In front of these photographs, the player can find a large operating table covered in large blood splotches. The surgical imagery (scissors, operating table, women’s photographs) act as indexes. These elements imply that the women may have previously undergone plastic surgery at this location.
However, the massive amount of blood hints that someone was harmed or killed on this operating table. The player may draw their own conclusions as to the significance and meaning of such a scene.

2.10 Calling Cards [15]
A “calling card” is a type of index. A designer can create a calling card by linking an object or item with an individual. The associated object (or “card”), then becomes an indicator of the person’s presence. Once the connection is established, the calling card could be used in multiple situations.

Gameplay designer and one of the directors of Spider: Rite of the Shrouded Moon, Randy Smith, discussed “calling cards” in his 2016 GDC talk. Smith mentioned that in Spider: Rite of the Shrouded Moon, there is a character who tends to leave candy wrappers around in all the places that he has visited. The candy wrappers now act as an “calling card” for this character. When the candy wrapper is in a space, the player can infer that this specific character was once in the same space.

3 LEVEL DESIGN PROCESS/METHODOLOGY

3.1 Narrative Overview of the Artifact
To apply the best practices and test to see their effectiveness, the researcher drafted a Fallout 4 single-player level called “Shelter Ark.” The level is a two-story interior space with multiple distinct rooms. The player moves through the “Ark” in a linear fashion. The researcher designed progression in such a way as to ensure players encounter narrative elements in a specific sequence.

At the start of the level, the player accepts a quest from the Institute to investigate the stability of a new energy source at the Ark. The Institute received threats from the notorious crime family, Basilio, who announced that they plan to steal the Institute’s technology. After the threat, the Institute had not heard from the Ark’s inhabitants for several days. The inhabitants included five volunteers: the manager, Sophia, and her daughter, Charlotte, the chef, William, the doctor, Natalia, and the scientist, Larry.

After investigating the Ark, the player comes to find that Larry was secretly replaced by a member of the Basilio crime family prior to the Ark lockdown. This “fake Larry’s” goal was to steal the unique power core. He killed the residents, all except Charlotte, but he ended up dying in the process.

The Ark’s first floor was designed to serve as a public lobby and residential area (including a kitchen, a dining space, a laundry room, and four bedrooms). All symbols and icons are initially introduced on the first floor. Additionally, each resident’s room contains the resident’s specific calling cards.

To enter the second floor, the player must investigate each resident’s room to find a stairwell passcode. While searching, the player encounters various key narrative elements.

The second floor was designed to highlight the conflicts between “fake Larry” and the rest of the residents. On the first floor, the player learned the meaning of each symbol and each character’s calling card. Now, the player can use this knowledge to discover what happened on the second floor and infer their own version of the events.

3.1.1 Implementation of “Slow Them Down”
In this level, the application of “Slow Them Down” is achieved using locked terminals and doors.
To reach the unique power core, the player must enter the second floor, then find the passcode to unlock the power core room. The researcher locked both the stairwell to the second floor, and the power core room, to force the player to “slow down” and investigate their surroundings. In the process of finding passcodes, the player enters several different rooms in a somewhat linear order. The
researcher added key narrative objects inside each room, to encourage the player to discover them while searching for the passcodes.

3.1.2 Implementation of “Put Them Where They’ll Be”

Many of the narrative related objects were placed around the critical path. Throughout the entire quest, the player needs to find five story pieces in the shelter. The five story pieces form a password that unlocks the power core room. In each room containing a piece of the password, the researcher decorated the scene so that it conveyed narrative information.

For example, one piece of the password is placed inside of the library.

In Figure 11, the player can only enter the library from the left side and must pass the table to reach the password piece. As a result, the researcher placed multiple narrative elements on the left side table.

3.2 Implementation of Semiotics: Symbols

The artifact contains two custom symbols: the killer symbol and the story symbol.

3.2.1 The Killer Symbol

The researcher created the killer symbol to test how to effectively define a symbol’s meaning to the player. The symbol’s appearance was intentionally designed to be abstract. It depicts a combination of a gear and a chess pawn piece. The killer symbol is also symmetrical, to represent the idea of “perfection.”

The killer symbol was the marker left by the Basilio crime family. They placed the symbol next to their victims. The researcher taught the player the meaning of the killer symbol through two different methods. Firstly, when the player accepts the quest from the quest giver, Mason, he mentions, “…we received a threat from a crime family. They always left the same logo to mark their crime.”

The player can also find the killer symbol inside of a book in the library. The book talks about the existence of the crime family and their family values. Secondly, when the player first encounters the killer symbol, it is placed next to a dead body and drawn using the victim’s blood. By having the symbol next to a corpse, the researcher is hinting to the player that the symbol is linked to the murder. It is a marker that the murderer left. The same symbol is subsequently found next to a few of the same killer’s victims.

3.2.2 The Story Symbol

The researcher designed the story symbol to look like a child’s hand-drawn castle. The castle represents the Ark.
The researcher picked the bright purple color to convey that this symbol is a positive and helpful symbol. The story symbol was made by the only child living in the shelter, Charlotte. With each symbol, Charlotte leaves a page of her own fantasy story. When the player puts all the fantasy story pages together, the pages form a secret code. The player can use the code to open the locked power core room. Charlotte left the notes and symbols as a hint to whoever entered the shelter after the tragic events.

The researcher taught the symbol’s meaning by placing the symbol and its concept together when the player first encounters it. The story symbol appears at total of five times in the level. The story symbol is spread throughout the level to encourage exploration. The first and second occurrences of the story symbol are on the critical path.

### 3.3 Implementation of Semiotics: Icon

**Figure 15: Restaurant Icon [16]**

An icon, by definition, needs to be immediately understood when viewed. As its name suggests, the “restaurant icon” represents the restaurant brand that Chef William runs inside the Ark. This icon consists of a chef's hat and a pair of knives and forks.

This icon is placed on the back wall of the restaurant area and inside the kitchen. These locations are all related to the idea of food and dining, which directly align with the restaurant icon's meaning.

### 3.4 Implementation of Semiotic: Indexes

**Figure 16: Indexes - Blood [16]**

The researcher used a variety of indexes throughout the level. However, they primarily used blood pools or blood drops. Blood implies the existence of a wounded or dead creature. In Figure 16, a female corpse lays on top of bloodstains, and there are knives stabbed in her head and back. The knives and bloodstains imply that this woman was killed and stabbed in the back. The dragging blood stains communicate that she was not killed at this location but might have been carried or might have crawled to this location before her death.

**Figure 17: Indexes – Footprints [16]**

The researcher also used bloody footprints to indicate that there was another person at the crime scene. As seen in Figure 17, the dead woman is in the chair and a person, presumably the killer, walked through the blood into the dining area and towards the kitchen. The killer may have entered the kitchen after they killed this victim. The footprint index implies the existence of the killer. It also serves to lead the player to their next objective.

**Figure 18: Indexes - Meeting room 1 [16]**
In Figure 19, the long table and surrounding chairs imply that this space is a meeting room. The toppled chairs and scattered papers indicate that a conflict or disagreement happened in this room.

When you look closely at the table, the four sets of files and the unique decorations convey that at least four people were gathered in the space. There are alcohol bottles sitting next to the chef hat, one of the bottles is broken and there is blood around it. These objects imply that the chef, who drinks a lot, threw a bottle in anger at another character. The other character likes blue vases.

### 3.5 Implementation of Calling Cards

The researcher created unique calling cards for each character that lives in the shelter. The player can discover these calling cards inside each character’s private room.

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**Figure 19: Indexes - Meeting room 2 [16]**

Charlotte is the only child that lives inside the shelter. She brings toys with her and leaves them behind. Her favourite toys are teddy bears. She treats them as her friends and often plays with them.

**Figure 1: Charlotte’s Calling Card [16]**

Sophia’s calling card is a blue-patterned vase with flowers inside (as seen in Figure 20). These vases are placed inside her room but can also be found in spaces that she normally appears, such as the front desk, and the meeting room.

**Figure 20: Sophia’s Calling Card [16]**

Natalia is addicted to coffee. There are unusual amounts of coffee cups, pots, and coffee tins stored inside her room. These objects communicate to the player that Natalia is a coffee lover. She is the only person who drinks coffee in the shelter, and usually brings coffee to the medical office and the club room.

**Figure 21: Natalia’s Calling Card [16]**

The “fake” Larry lines up everything in perfect order. This rule not only applies to his lab supplies, but also his personal items.

**Figure 22: Larry’s Calling Card [16]**
William is the chef who runs the restaurant inside the Ark. His calling cards include the chef suit and hat that he normally wears, the restaurant icon, and alcohol bottles. He has a diverse collection of alcohol inside his room and brings it to the kitchen, setting up a small area to enjoy a drink.

4 RESULTS & DATA ANALYSIS

To measure the effectiveness of the identified best practices, the researcher gathered playtesters to play the study’s artifact. These playtesters were then given a post-survey asking about their understanding of all the semiotic elements.

The post-survey had 40 questions in total, including quantitative (multiple choice) and qualitative (open-ended) questions. The survey contains questions about all the best practices, including symbols, icons, indexes, and calling cards.

The researcher was able to recruit 17 participants. However, two participants were considered outliers, because one tester has color amblyopia, and the other tester did not notice any of the semiotic elements in the level. All the other participants noticed at least two semiotic elements, however, this particular tester noticed none of them.

4.1 Results for Symbols

4.1.1 Killer Symbol

The killer symbol, which represents the Basilio crime family’s marker, was correctly understood by 12 out of 15 testers. The majority of the participants were positively certain about the meaning of the symbol. The participants stated:

- “That is the symbol of Basilio, the crime family.”
- “The Basilio family”
- “Basilio the Pawn - it’s a symbol of the Basilio crime syndicate.” [17]

Three participants picked “neither uncertain or certain.” These participants’ responses included:

- “I think it means The Queen. Sophia was suspiciously absent in the trail of dead bodies.”
- “I believe that this symbol is meant to highlight ‘hey this is something important.’”
- “This Icon is a combination of gears and chess pieces, I think it represents tools, gears and chess pieces are both rather unusual widgets but don’t feel very relevant.”
4.1.2 Story Symbol

As for the story symbol, 14 out of 15 participants understood its meaning correctly. Participants were strongly certain that the story symbol was related to story pieces. They also believed that this symbol was a hint, left behind by Charlotte, about the power core room password. The participants stated:
- "This symbol represents where one of the story pages is located."
- "Castle, hint"
- "Charlotte’s (Kid) drawing symbol"

4.1.3 Symbol - Results Analysis

Both the killer symbol and the story symbol were understood by the majority of the playtesters. However, the story symbol is significantly more successful. Both symbols are defined multiple times and appear numerous times in the level. By comparing the implementation of the killer symbol and the implementation of the story symbol, the researcher noticed a couple key differences:
1. The killer symbol appeared 3 times, while the story symbol appeared 5 times in the level.
2. Players are required to understand the story symbol’s meaning (must recognize this symbol) to complete the level. The player is not required to understand the killer symbol for progression purposes.

The researcher determined the following rules for using symbols in environmental storytelling.
1. Define the symbol multiple times to the player and ensure that the symbol and its definition are seen together at least once.
2. Force the player to encounter the same symbol more than 3 times in a level.
3. Tie the symbol’s meaning to an object or element required to complete the level.

4.2 Results for Icons

For the restaurant icon, 14 out of 15 participants understood its meaning correctly. However, only 7 testers believed they understood this icon correctly (2 somewhat certain and 5 strongly certain). An icon “allows the reader to understand its meaning instantly.” By this definition, the researcher believes that the design and the placement of the restaurant symbol was successful.

Some of the playtesters’ responses included:
- “Chef’s symbol.”
- “I think this is a food icon, it shows a chef's hat as well as a knife and fork, so I think this should be food related.”
- “I actually didn’t notice this one in the game, but it looks to be associated with the Chef, William.”

4.2.1 Icon - Result Analysis

Despite half of the playtesters being uncertain about the icon’s meaning, 94% (14 out of 15 testers) of the participants identified the restaurant icon’s meaning correctly. These results indicate that the following best practices are effective when using icons in environmental storytelling:
1. The appearance of the icon needs to align with its meaning.
2. The use of an icon needs to also align with its meaning.
4.3 Results for Indexes

Figure 31: Indexes – Footprints [16]

All 15 participants correctly understood the narrative context of the scene depicted in Figure 31. The participants believed that a woman was murdered, and the killer stepped into the woman’s blood. The killer then walked into the kitchen area. Nine answers mentioned that she was killed by the Basilio crime family. Some of the responses included:

- “The guy from the crime family killed Sophia and placed the calling card near her.”
- “This female is murdered and then the murderer heads to the top left of the picture.”
- “Sophia was murdered by the Basilio.”

The rest of the playtesters (5 testers) were either unsure of what happened inside this room or had their own interpretation, as the following responses show.

- “I’m not sure.”
- “There was not a fight but rather someone was tossing around papers and chairs as they were looking for answers.”
- “Someone tore up the book and dropped it on the floor.”

4.3.1 Indexes - Result Analysis

Indexes are very effective when the index is related to only one element. For example, the bloody footprints, seen in Figure 31, imply that someone walked through the crime scene after Sophia’s death.

However, when the index is related to multiple elements, it is necessary to have additional information to help communicate the intended narrative. For example, a meeting agenda placed on the table clearly implies that a meeting was held inside this room.

Using an index, which relates to multiple elements, supports the concept of White Space Storytelling. It leaves narrative blanks for the player to fill in themselves.

4.4 Results for Indexes: Calling Cards

The researcher implemented a variety of calling cards throughout the artifact level. This section below only focuses on the least and the most successful calling cards based on the tester feedback.

4.4.1 Sophia’s Calling Card – Blue Vase

Figure 33: Sophia’s Calling Card [16]

Figure 34: Survey Result – Sophia’s Corpse [17]

Despite the fact that 12 out of 15 participants recognized the pictured (Figure 34) corpse as Sophia, none of the
participants mentioned the blue-patterned vase in the subsequent, corresponding open-ended questions. Participants identified this character as Sophia because they believed that she was the manager. Multiple answers also mentioned her role as Charlotte’s mother. Some responses included:

- “She is the manager of the building.”
- “Sophia is the mother of Charlotte, and the manager of the facility.”
- “She is at the reception desk.”

The researcher assumed that the participants would believe Sophia is the manager for the following reasons:

- The corpse is located at the front desk.
- She’s wearing a manager-like suit.
- She has the shelter’s map and the resident list.
- The resident list labels her as the manager.

4.4.2 William’ Calling Cards – Chef Hat, Alcohol

The corpse is a common element used in storytelling to convey the character's background. In this case, the chef hat and suit were very iconic imagery. These clothing items implied his occupation and helped to identify him.

When the calling card is not related to the character’s physical appearance, the card may need to be defined. Sophia’s blue vases might easily be considered as part of the level decoration. Sophia does not have a strong contextual tie to this vase. In the real world, who would logically possess all those vases? The researcher believes that further research is needed to fully discover how to define a calling card.

4.5 Narrative Environmental Storytelling Feedback

The researcher implemented several hints throughout the level to imply that the scientist Larry, was replaced by a member of the crime family. These clues included:

- Notes and terminals conveying the change in Larry’s hair color (from ginger to black).
- Natalia’s diary relaying information about Larry’s personality and habits, claiming he was a less organized person.
- Newspapers talking about the crime family leader’s sons. Both sons have black hair.
- An extra naked corpse hidden inside the secret lab room (where the player can find the last passcode digit).

In the post-survey, the researcher showed screenshots of both Larry, and the fake Larry’s corpse, and asked participants to identify each character.

All the participants believed that the pictured (Figure 36) corpse was William. Additionally, 9 responses mentioned he is the chef, and 10 responses mentioned that he is an alcoholic. The participants stated:

- “William loves to drink alcohol.”
- “His costume is obviously a chef.”
- “He is the chef who steals wines and supplies.”

4.4.3 Indexes: Calling Card - Results Analysis

A calling card is effective when it’s directly linked to the character’s physical appearance. As for William, the chef
Five participants believed that fake Larry, the person dressed up as a scientist, was the real Larry. Six participants picked “Other.” Some of the responses included:

- “He is in a researcher’s suit.”
- “He is the killer?”
- “The pawn from the crime family.”
- “Fake Larry”

Seven playtesters who believed that the naked man (pictured in Figure 39) was the real Larry. However, there was 1 participant who believed that this naked corpse was the crime family member. Some of the responses included:

- “I think this is the REAL Larry.”
- “No clue”
- “This man is from the Basilio crime family. I still don’t understand how HE died.”

### 4.5.1 Narrative Environmental Storytelling Feedback - Result Analysis

As the results show, nearly half of the players noticed Larry was replaced by the killer. Both the real Larry’s identification and the fake Larry’s identification were entirely optional for the player. Players who discovered the truth behind the Larry situation helped to prove the theoretical practices, “Slow Them Down” and “Put Them Where They’ll Be.” However, these practices are limited. “Slow Them Down” and “Put Them Where They’ll Be.” Can only effectively help provide narrative information to the player if the player pays attention and is actively engaged with the scene.

### 5 CONCLUSIONS

After analysing the survey data, the researcher concluded that the semiotic best practices were effective for communicating narrative information, when the following rules were applied:

- Define the symbol to the player multiple times on their critical path and ensure the player encounters the same symbol more than 3 times.
- When the symbol’s meaning is related to something that is required to complete the level, such as keys, passcodes, and pickups, the player is more likely to notice the symbol, and understand its meaning.
- When using an icon, the icon’s appearance must align with its meaning. The icon also needs to be used at locations that align with the meaning.
  - It could be more effective to put the icon “where the player will be,” to ensure it’s noticed.
- Indexes are effective when they are related to one element (bloody footprint = someone was walked through blood.)
- A calling card is effective when it’s directly linked to the character’s physical appearance. Calling cards can also be effective if the calling card was strongly defined to the player and the existence makes real-world logical sense.

To conclude, semiotic elements are very effective in communicating narrative if it’s used according to specific rules. Even though players are encouraged (not forced) to encounter narrative elements, the theoretical practices, “Slow Them Down” and “Put Them Where They’ll be” are very helpful in leading players to narrative pieces. After all, even if the player did not fully picture the narrative as the designer intended, as long as the player understood around 80% of the narrative correctly, it is considered a success. According to the concept of White Space Storytelling, a good narrative experience allows the player to contribute and craft their own part of the narrative.

### 6 REFERENCES


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