

Exploring the Role of Narrative Puzzles in Game Storytelling

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ABSTRACT

In this paper, we consider narrative puzzles in story-driven video games as distinct design elements of great narrative importance. While many scholars and designers focus on the inner workings and mechanisms of puzzles, we delve deeper into the role that puzzles play in the unfolding and the player's experience of game plot. Drawing on examples from a variety of games that are rich in narrative puzzles, we present an initial taxonomy of the functions a narrative puzzle can perform for game storytelling and discuss their potential implications. Through the analysis and discussion, the paper aspires to contribute to both game analysis and game design with a new analytical lens as well as description of some potential design patterns that involve narrative puzzles.

Keywords

Narrative puzzle, narrative design, game design, interactive narrative, story-driven video games

INTRODUCTION

In game design, puzzles stand out as one of the most common mechanics. They not only characterize the gameplay mode, but also are one of the defining characteristics of the genre of adventure games (Fernández-Vara 2014b, Adams 2014). Puzzle play is regarded as a 'thinking' mode of play as opposed to the 'action' mode of play, promoting problem-solving skills. Despite its important position in game design and gameplay, puzzle solving is also frequently considered a tedious experience in many games, breaking the balanced state of 'flow' of the player. The two opposing views of puzzles aside, it is undeniable that puzzles play an important role in many adventure games or, to many, are the staples to the genre. With an expertise in adventure game analysis, Clara Fernández-Vara (2009) points out that puzzles in adventure games are frequently integrated into the narrative events, and the game story is advanced through puzzle solving. In a later work, she further defines this type of puzzles as "narrative puzzles" (2014a).

In a similar vein, we focus specifically on the type of narrative puzzles but we do not limit our investigation to the genre of adventure games only; instead, we intend to examine narrative puzzles in the broader context of story-driven video games. Focusing on narrative puzzles allows us to delve deeper into the role that puzzles play in the unfolding of narrative events from the player's perspective as well as in the construction of game plot from the designer's perspective. The paper calls for a shift of attention away from the inner workings and classifications of puzzles based on their puzzle-solving mechanisms; instead, we propose to adopt a narrative perspective

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to understand how puzzles work as narrative devices in relation to the game plot progression driven by the player's action and choices. Therefore, the research goal of this paper is to uncover the under-explored role that puzzles play in game storytelling.

Based on our own survey and analysis of a range of story-driven games as well as relevant game analyses found in the literature, we are able to draw distinct examples from a variety of games that are rich in narrative puzzles. In an inductive approach, we examine these examples and present an initial view of the functions that a narrative puzzle can perform for game storytelling. Through our analysis and discussion, we intend to contribute to both game analysis and game design by proposing a new analytical lens of narrative puzzles as well as describing a set of related design patterns.

PREVIOUS DISCUSSION ON PUZZLES

Definitions of Puzzles

Puzzles are a popular topic in the literature of game design. As Fernández-Vara (2014a) nicely summarizes, “puzzle design means providing the player with a challenge that has one solution, and requires thinking rather than skills” (233). Classically in game design textbooks, puzzles are discussed as a game element or mechanism (e.g., Bates 2004 and Schell 2015), as a game genre in its own right by most authors (e.g., Rogers 2014 and Adams 2014), or as an important play activity (Fullerton 2014). Under these lights, below are a few representative definitions of puzzle by game designers, as well as by Cambridge Dictionary for reference.

“[P]uzzles are just miniature games whose goal is to find the dominant strategy.” (Schell 2015, 241)

Puzzle is a “mental challenge with at least one correct solution state that the player must find.” (Adams 2014, 519)

“A puzzle is fun. And it has a right answer.” (Scott Kim, cf. Fullerton 2014, 38)

Puzzle is “a game or toy in which you have to fit separate pieces together, or a problem or question that you have to answer by using your skill or knowledge.” (<https://dictionary.cambridge.org/dictionary/english/puzzle>)

These definitions all speak to the problem-solving nature of puzzles; moreover, designers' definitions emphasize having a dominant solution as one defining characteristic. For the purpose of this paper, we treat puzzles as design elements existing in games. This will help us define the boundary of a puzzle more easily so that we can consider puzzles as structural units in the game system. Therefore, we find the first two definitions above most relevant to our study.

Approaches to Classifying Puzzles

Many taxonomies have been proposed to categorize puzzles by designers and scholars. In many cases, puzzles are typecast as self-contained mechanisms by their inner workings exemplified by well-known examples, such as Rubik, Sudoku, jigsaw puzzle and so on. In other cases, the taxonomy will be formulated based on the characteristics of the puzzle as a unit that contains one or more tangible objects (e.g., in-game items) or intangible objects (e.g., a piece of information). For example, game designer and author Bob Bates (2004) assembled a list of puzzle types by examining the way of how objects are used, including such types as “ordinary use of an object” (relatable to “key in lock”), “unusual use of an object,” “building puzzles,” “information puzzles.” Moreover, he also listed some more abstract types, such as

“word puzzles,” “timing puzzles,” “sequence puzzles” and so forth. Similarly, Fernández-Vara and Thomson (2012) observed the use of objects and gave a short list of some high-level narrative puzzle patterns derived from adventure games, such as “giving an object to someone who will provide a reward in exchange,” “combining two items that result in a new object,” and so forth.

Using a slightly different approach to the in-game objects, game author and blogger Jasper McChesney (2017) proposed a two-tier taxonomy of adventure puzzles based on the characteristics of objects involved in a puzzle. He identified four types of objects in the game world inventory and environment. The first type is inventory items, which are movable, reusable, and combinable with one another to form new objects. The second type is environment items, which are stationary, more static, and interacting with inventory items at a fixed in-game location. The third type is items that are not yet included in the inventory and waiting to be picked up often as a reward instead of being a puzzle element. The fourth type is information, journals, notes gathered to interact with the NPCs, which do not engage with physical or mechanical puzzles. Based on one or a combination of the above types of objects, McChesney derived a series of puzzle types, such as “mysterious device,” “fetch,” “key in lock,” “gather clues,” “hunt the pixel,” and so on.

Although there is no unified approach to classifying puzzles, the above brief review shows the key lens of looking at puzzles is the types of objects involved and how these objects are used in the course of puzzle solving. The mechanical focus on objects shared by many existing analyses comes from a design perspective, where the goal of studying puzzles is either to find out what makes a good puzzle or a bad one, or to identify puzzle design patterns that can be applied in creating various puzzle challenges.

DEFINING NARRATIVE PUZZLES

In this section, we trace the previous discussion of narrative puzzles, which was originated in the study of adventure games. In an attempt of establishing “narrative puzzles” as a concept relevant to game storytelling, we intend to extend our scope of investigation beyond adventure games and to look how narrative puzzles exist in various types of story-driven games, assuming they do exist in non-adventure types. With this intention, we thus seek a definition for narrative puzzles that are not limited to adventure games and better address our research goal.

Narrative Puzzles in Adventure Games

Although puzzles are not the usual focus of formal and critical game analyses, they are an inevitable and critical aspect for the analyses of adventure games. Fernández-Vara (2014a) analogizes puzzles of adventures to quests of computer role-playing games. While “different quests provide a set of goals to the player,” a series of narrative puzzles “give way to the story of the game as the player solves them” (152). In this sense, both quests and puzzles contribute to the game progression, which “regulates how the player advances in the game, and relates to its goal structure” (152). On a separate account, she commented on the narrative nature of puzzles in adventure games:

The predominant type of gameplay is puzzle-solving; puzzles are integrated in the fictional world of the game, so the objects and characters of the story create the challenge. The solution to puzzles may rely on general knowledge, such as locked doors that need keys to be opened, or basic trading conventions. More often, the player must learn the workings of the fictional world in order to tackle its challenges. (Fernández-Vara 2014b, 234)

Speaking further of the characteristics of adventure game puzzles, she provided a loose definition of narrative puzzles in the following:

Adventure games thrive on puzzles, but most of them are of a different type—the puzzles are part of the events of the story. The player has to give an object, fix a machine, open a door, which are all events in the story. Therefore, we can call this type of challenge *narrative puzzle*, which brings together literature and game design. (Fernández-Vara 2014a, 233, author’s italics)

Fiction Puzzles

While Fernández-Vara’s approaches to puzzles were rooted in the context of adventure game analysis and design, Veli-Matti Karhulahti (2013) took a philosophical approach and examined the ontology and aesthetics of puzzles in a broader context of video games and video game challenges. In his view, puzzles—as one type of video game challenges—are (1) based on a structure of statics, (2) form-independent, and (3) non-kinesthetic.¹ Later he went on to narrow his focus down to a related subgroup that he termed as “fiction puzzles” and present a framework to examine their aesthetic value (Karhulahti, 2014). In Karhulahti’s definition, a fiction puzzle is “a problem in a storable world the nonkinesthetic solving of which does not entail configuration of dynamics”² (205). Fiction puzzles in video games, as he pointed out, have their own mechanics that oftentimes, but not absolutely, requires players to execute the solution through configuring such “controllable existents” as objects and characters. In Karhulahti’s terms, fiction puzzles are “not exclusive to narratives or adventure games”; “puzzles with narrative functions” and the usual adventure game puzzles could be subclasses of fiction puzzles (203).

Puzzles and Interactive Narrative

An understanding of a puzzle presented by and as a formal element of an interactive narrative would necessitate an understanding of the relationship between the puzzle-solving action and the storyworld. Nick Montfort (2007) explored some of the related questions in depth in the context of interactive fiction (or the text adventure), with insights highly adaptable to the broader form of interactive narrative including story-driven video games. One question, for example, is whether the player is acting *through* a story/game character or straightly on his/her own behalf. Is there any difference between these puzzles presented in these two situations? Montfort concluded: “a puzzle does need to be presented as a challenge to the *interactor*, not necessarily to the player character. ... Although the IF [interactive fiction] world is essential to puzzles, puzzles are ultimately posed to the interactor outside the level of the IF world” (48, author’s italics). As for another important question—whether puzzles have to “be ‘required’ for a successful traversal” in order to be puzzles, Montfort answer was no (50). He suggested that “[w]hile the typical way of doing this is to make the solution to a puzzle a requisite for a successful traversal, puzzles can be presented in some other way” (49). He then further clarified that “[a] series of actions that is required for a *successful traversal* but is not a puzzle can be considered a *task*” (51, author’s italics).

Definition of Narrative Puzzles in Game Storytelling

From the above literature review of both puzzles in general and puzzles in a story context, we can see that efforts were concentrated on establishing them as a distinctive puzzle group, including identifying the defining characteristics and enumerating different puzzle types or styles using examples. By privileging certain aspects over others, discussion on puzzles in a story context employed various terms such as “narrative puzzle” and “fiction puzzle.”

In this paper, we will use the term “narrative puzzle” to refer to the group of puzzles found in story-driven video games that carry one or more narrative functions in addition to their original puzzle functions. Taking note of the previous definitions mentioned in this section, we integrate a few critical aspects and give a revised definition below to facilitate our analysis of the role a narrative puzzle plays in game storytelling:

A narrative puzzle is both a narrative event (or a part of a narrative event) and a mental challenge with at least one correct solution that requires the player to discover and execute a particular series of actions.

The first aspect and also defining characteristic of narrative puzzles speaks to their narrative nature; that is, they are one or a part of narrative event of the game’s storyline. This characteristic echoes with Fernández-Vara’s definition, drawing a line between non-narrative-puzzles and narrative puzzles that both exist in story-driven games. It sets them apart from those puzzles of which the solving action is not meaningfully related to the storyline. The well-known type of puzzle in *BioShock* (2K Games 2007), the “hacking minigames,” can serve as a representative example of puzzles that are *not* narrative puzzles, even though they are in a story-driven game. While the player needs to turn the pipe pieces to connect the input to the output of a “machine” to get to the next game segment, the required actions are not directly related to the game narrative and mainly serve as breaks from the usual shooting gameplay mode (Totilo 2007).

Using narrative event as a gauge of puzzles can also help us find the right scale for puzzle analysis. Here we mainly refer to narratologist Mieke Bal’s (2009) definition of narrative event—“the transition from one state to another state, caused or experienced by actors” (189). When there is a meta-puzzle (a puzzle made of a set of sub-puzzles), or when puzzle solving requires a long sequence of actions, it can be quite difficult to locate the boundary of a puzzle. By focusing on whether the sequence of actions constitutes a narrative event that involves a change of state, we can find the boundary (i.e., the beginning and ending) of a puzzle, more easily.

The second aspect addresses the problem-solving nature of all puzzles, whereas the third aspect stresses the characteristic of execution that is game specific. This “sequential” or “procedural” execution is emphasized by both Karhulahti (2014) and Montfort (2007). As mentioned earlier, Karhulahti described the execution is done through “configuring such ‘controllable existents’ as objects and characters” (203). Montfort, on the other hand, pointed out that the execution requires “a non-obvious set of commands” in the context interactive fiction (48). Here the commands can be considered to correspond to actions in a graphically represented game.

Among the very limited literature that was dedicated to puzzles in a story context, the focus was mainly on identification and classification of narrative puzzles with examples almost exclusively found in adventure games. The analysis and classification of puzzles has been more on the puzzle’s inner mechanisms than on varied ways puzzles can affect the game storytelling. Fernández-Vara (2009) uncovered that adventure game puzzles are mechanics for players to advance the game plot or to gather information in the environment in order to understand how the game world works. We therefore would like to find out: within and outside the adventure game genre, are there any other ways narrative puzzles can shape players’ narrative experience, such as changing players’ comprehension of the game narrative or players’ decision leading to different plot trajectories if not an alternative ending?

A FUNCTIONAL LOOK AT NARRATIVE PUZZLES IN GAME STORYTELLING

Method

In this paper, we aim to explore the main functions that narrative puzzles play in game storytelling. Our primary source of observations comes from our puzzle-centric analysis of a range of relatively recent, story-driven, single-player games. Our initial screening went beyond adventure games to cover action-adventures, role-playing games, puzzle games, platformers as well as shooters. Through first-handed gameplay and online game walkthrough of 2-3 representative titles of each genre, we excluded shooters and role-playing games. Shooters' gameplay emphasizes quick actions and most shooters do not feature narrative puzzles. Because the gameplay mode and storytelling method of role-playing games are very similar to adventure games, we considered their narrative puzzle types are also quite similar and decided not to explore this genre in depth in our first round of puzzle analysis. Most puzzles in puzzle games are abstract, even for first-person shooter puzzle game *Portal* (Valve Corporation 2007), which has an intriguing plot but the puzzles are nearly all spatial puzzles happening in an abstract space. The puzzle-based progression takes place in parallel with the game story narrated via audio announcements; hence, they are hardly narrative events in the real sense and so not exactly narrative puzzles. From our quick, non-rigorous screening, narrative puzzles indeed have the largest presence in adventure and action-adventure games, although we did select *Braid* (Number None 2008) as one example of a non-adventure genre.

We thus narrowed down and focused on three types of games. The first type has four detective-themed adventure titles that contain the most complex and diverse puzzle mechanics with sophisticated game plots: *L.A. Noire* (Team Bondi 2011), *Professor Layton vs. Phoenix Wright: Ace Attorney* (Level-5 and Capcom 2012), *Sherlock Holmes: Crimes and Punishments* (Frogwares 2014), *Sherlock Holmes: The Devil's Daughter* (Frogwares 2016). The second type has the action-adventure series *Uncharted*, where narrative puzzles are embedded in the experiences of treasure hunting and mystery discovery. The selected titles of the series are: *Uncharted 2: Among Thieves* (Naughty Dog 2009), *Uncharted 4: A Thief's End* (Naughty Dog 2016), and *Uncharted: The Lost Legacy* (Naughty Dog 2017). The third type has the distinctive and critically acclaimed puzzle-platformer *Braid*. The rationale of this selection is to observe diverse narrative puzzle design across varied subgenres of adventure games and, in the meantime, to see how puzzle design evolves over the past decade or so, if any, by tracing installments of the same series that share the constraints of same high-level game world logics.

In our definition of narrative puzzle, we consider puzzles are events or parts of events in the narrative. As such, the function(s) a puzzle performs is aligned with the function(s) the associated event performs in the game narrative, if not more. Therefore, our initial investigation presented in this paper will adopt the structuralist convention found in many narratological theories, such as Bal's (2009). For each puzzle, we observe its relation to the larger narrative sequence where it is embedded, as well as its effect on the gameplay. The former angle will reveal how the game plot is organized with the help of the puzzle and the latter will indicate how the puzzle can potentially affect the player's comprehension and even control of the game narrative.

Function 1: Preparation and Acquisition

Because of its foundational role and its tendency to appear earlier in the game or a game chapter, our first function on the list is preparation and acquisition. Puzzles in this functional group oftentimes appear to be 'solutionless'—a feature that raises the

question whether these puzzles' are actually puzzles by usual definitions. 'Solving' these puzzles are fundamental steps to begin a game or a game chapter, through which players acquire narrative information (e.g., clues, background information) or in-game items in preparation for future puzzles.

When the player is still oblivious to the game world and being introduced to a situation not yet leading to the main plot, some information might seem 'clueless' and items 'useless' (but will be in the player's inventory anyways). Nevertheless, Karhulahti (2014) argues that these solutionless puzzles are "story-related problems that provide short-term aesthetic experiences" (205). These puzzles lead the player through to actions and situations that eventually lead to significant narrative consequences.

As a routine in detective games like *L.A. Noire*, *Professor Layton vs. Phoenix Wright: Ace Attorney* (Layton, in short), and *Sherlock Holmes*, an incident scene and a victim are presented as the prologue of a chapter. The player character needs to walk around, talk to a P.O.I (person of interest, NPC), and access the archives, and so on, in order to meet the chapter goal. By examining the environment, the player will get a clue or a piece of evidence for the inventory, or a record on the journal/logbook/notebook depending on the system design. **Figure 1** shows such an example from *L.A. Noire*. When interacting with each in-game object, the playable character would have the tendency to carry on a monologue, in reflection to the current event, which might misdirect the player (i.e., red herrings) as part of the challenge to access future puzzles. When conversing with a P.O.I, the puzzle is to obtain the correct keywords from the character's description of what happens, which would help validate the crime situation and/or this character's profile for future reference.



Figure 1: A screenshot of *L.A. Noire* and its zoomed-in view shows that once (the player character) detective Cole Phelps picks up the correct evidence, a driver's license in this case, a new investigation objective will be added and shown on the screen.

Function 2: Advancement and Guidance

The most fundamental function of narrative puzzles, as acknowledged earlier by Fernández-Vara (2014), is the advancement of the game plot. In their execution in open world game, the puzzles often serve as a guidance and a nudge for players to go to the venue of the next plot segment.

In a more action-oriented design style, the *Uncharted* series employs most narrative puzzles simply for plot advancement. For example, in the chapter "A Visit to the Library" of *Uncharted: The Lost Legacy* (*Lost Legacy*), the player, as Chloe, has to solve a puzzle that requires rotating various elements to match them to each other.

The first part is to assemble pieces together and make up a painting of Parashurama and Ganesha. The next part is to move limbs of Ganesha's statue in order to match the painting. After achieving these tasks, the player would be able to interpret how Ganesh sacrificed himself to preserve his father's honor. A tusk, which is the objective of the entire adventure of the game, is now revealed, and Chloe is now able to save her companions who are under the antagonist's threat.

If *Uncharted* games are limited in their puzzles' narrative functions due to their linear storytelling as well as player movements, *L.A. Noire* delivers a more non-linear experience in terms of player movements. However, the tradeoff is possible disorientations the player might get. In this light, narrative puzzles during case-solving in the game will unlock a clue (to show on the game interface) as a 'reward' whenever such a puzzle is solved. Following the 'new clue,' players will know where they should go if they want to follow the main plotline. On the other hand, if failing to solve the puzzle and obtain the clue, players will find themselves unable to advance the game plot although they can keep exploring the open world. To complete the game, they often need to repeat the same investigation (or puzzle).

Function 3: Creating Plot Variation

In addition, our study of the first set of game titles with detective themes revealed that many puzzles are embedded with crucial plot points from which narrative branching can happen. At these points, the player's performance in solving a puzzle can determine which branch the game plot will follow. In other words, this type of narrative puzzle not only advances the game plot, but also has potential to change plot trajectory and create plot variations.

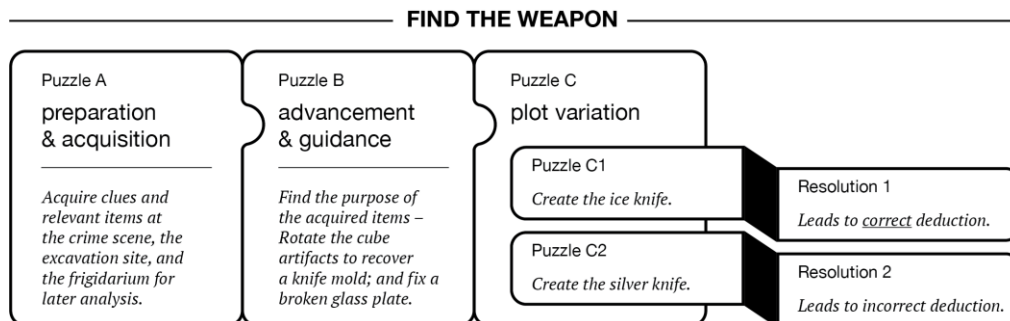


Figure 2: A gameplay sequence consisting of various puzzles in *Sherlock Holmes: Crimes and Punishments*.

One representative example of puzzle series can be seen in the chapter “Blood Bath” of *Sherlock Holmes: Crimes and Punishments*, which is illustrated in **Figure 2**. In this chapter, Sherlock Holmes's goal is to find out how the victim was murdered in the apodyterium and also to locate the missing weapon. First, a series of clues lead him to an excavation site, where he needs to acquire the right artifacts—an action of solving a “preparation and acquisition” puzzle itself—and then decides to bring them back to his study for analysis. Next, the player, as Holmes, is to solve the puzzle with the collected artifacts shaped like cubes. The puzzle solving requires rotating the cubes horizontally and vertically to look at all the joints and sides, which will lead to a revelation that these artifacts can make a mold. Then the above two puzzles consecutively advance the game plot to a plot point where two new puzzles are presented to Holmes. This means now the player has to create one ice knife and one silver knife, since diluted blood sample and melted silver were collected from a crime scene shown at the beginning of the chapter. After successfully solving the two

puzzles—i.e., by creating one or two knives with the mold, the player can finally solve (or failed to solve) the overarching crime case by making a deduction based on the two knives and previously accumulated clues. At the end of the overarching puzzle series, the player’s puzzle performance determines which of the two branches—representing the right and wrong outcome—the future game plot will follow (see the branching in **Figure 2**). It is also helpful to see the in-game visualization panel interface shown in **Figure 3** for the structure of the puzzles and evidence leading to a crucial clue.

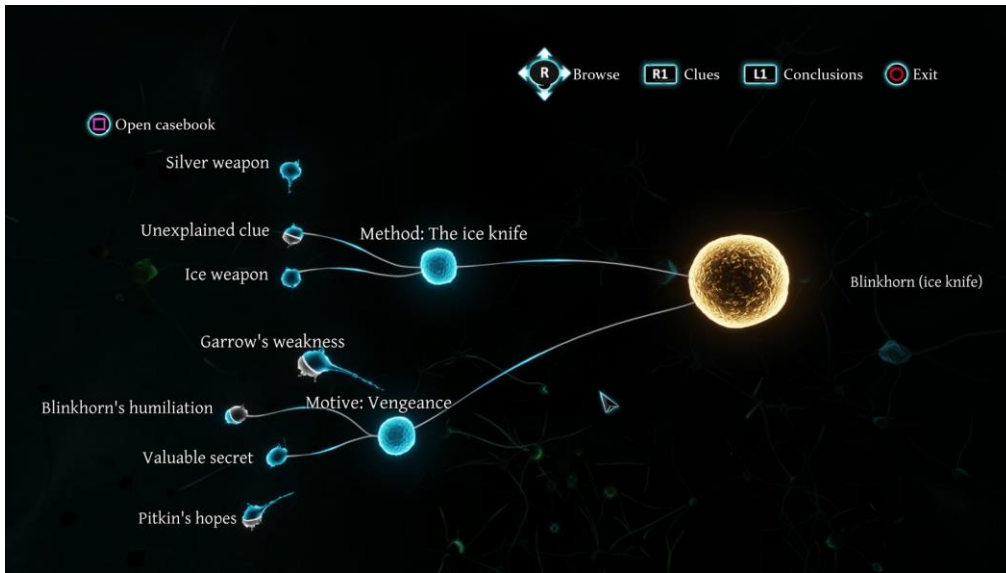


Figure 3: A screen shot of the deduction panel of the “Blood Bath” case that visualizes Sherlock Holmes’ thoughts and collected clues in order to arrive at the correct result of the investigation.

Another interesting individual puzzle example can be found in the chapter “Mysterious Labyrinthia” of *Layton*. In a scene where Layton and his apprentice Luke cannot access the town of Labyrinthia, the two characters (both controlled by the player in this scene) need to walk around and talk to the townspeople. When they run into two kids (Cecil and Petal) who are upset about their usual play space being occupied by two strangers, they are presented with a puzzle titled “Unusual Music Box” as the kids intend to use this puzzle to test their trustworthiness. This puzzle is not mandatory in the game, but the design of the music box shows four figures: a king, a princess, a knight, and a minstrel that might give hints on the characters of the game world (i.e., Labyrinthia in this case). In a different way of creating plot variations, this ‘optional’ puzzle gives an opportunity to the player to obtain more background information (and more fun for hard-core fans).

Function 4: Pacing and Structuring

Lastly, narrative puzzles can help pace the plot and gameplay along the game progression in various ways, such as aligning the level of difficulty to the narrative arc to pace out dramatic tension (as discussed in Menzel’s 2016 GDC talk, which will be mentioned later) or using varied scales of the puzzles to create a desired rhythm. Karhulahti (2014) also discussed this point from an experiential point of view, claiming that “[f]rom the perspective of the potential integral narrative experience, one of the most vital functions of fiction puzzles is story pacing” (206).

As constructs of game plot, narrative puzzles can also be used as narrative units. This is mostly seen in detective-themed adventure games, where puzzle activities are highly integrated into case solving. In *L.A. Noire* and *Sherlock Holmes* games, most game plot events are presented in the form of a puzzle. For example, the low-level, repetitive events along the main plotline in *L.A. Noire* take mainly two formats: one is interviewing P.O.I. and the other inspecting potential evidence items on the site. Both formats of events are filled with puzzle content. This structure may feel tedious; however, the game escalates on its storytelling complexity by creating multiple narrative levels in an embedded and nested structure. As embedding is already widely used to structure game narrative content (Wei 2010), adopting this technique for puzzle design is a natural choice for the purpose of creating narrative depth.

In the puzzle-platformer *Braid*, we see an unusual way for this genre that uses meta-puzzles as the structure of plot units and game levels. At the bottom level, each of the player character Tim's movement puzzle represents an event that Tim needs to complete by solving the challenge in order to traverse each of the six game worlds. At a higher level and functioning as rhythmic beats—among other things, a jigsaw puzzle is offered at the end of each game world, providing all the puzzle pieces were collected along the gameplay. These jigsaw puzzles present metaphorical paintings showing different moments of Tim's life, triggering the player to interpret and imagine the happenings in Tim's world. As such, the puzzle and narrative structure of *Braid* helps form a unique rhetoric. This rhetoric, as observed by Luke Arnott (2012) in his comparative analysis of *Braid* and Georges Perec's puzzle-themed novel *Life A User's manual*, is

a semiotic system of communicative overtures from a puzzle maker to puzzle solvers, based on the spatial relation of objects not only within the texts (i.e., the diegetic space of game and novel) but also within their meta-textual features (the arrangement of chapters, graphics, extra-diegetic pictographs, etc.). (434)

DISCUSSION

Our initial observation of the major functions that narrative puzzles perform in game storytelling opens up a new research and design space, where new interactive storytelling techniques could be developed by taking advantages of narrative puzzles.

The status quo of puzzle design has not changed significantly over the past few game console generations. Tracing through the *Sherlock Holmes* and *Uncharted* series, we have not seen big differences in puzzle design patterns across their installments over the years, nor newer innovative uses of puzzles as storytelling devices. If anything worth noting, one new feature in puzzle design can be seen in the later *Sherlock Holmes: The Devil's Daughter*. In older installments, when Holmes reconstructs a crime sequence in his mind, the game will visualize the scene allowing the player to take a third-person point of view to investigate the environment. However, in a same reconstruction sequence of the chapter "A Study in Green" of newer *Devil's Daughter*, the player is given a first-person point of view to enter and investigate the environment of the Mayan temple. What is more interesting is that, when Holmes fails to solve the spatial puzzle, the player will experience a blackout (as if Holmes dies) and the sequence will be repeated for play. Although all these happenings are supposed to be in Holmes's mind, this first person experience inside the puzzle triggers a much higher level of empathy.

This example shows that there is much to explore in the space of storytelling and puzzle design. Some attempts have been made, such as the techniques discussed by level designer Jolie Menzel (2016). She describes puzzles as a combination of mechanics and theme. Here mechanics are the "verbs" for what the player can do,

whereas theme is the narrative and presentation to provide the player context of the game world respectively. When designing puzzles, there is a dilemma about being narrative-focused and challenge-focused that would deter the player, therefore each new mechanic and/or information should be gradually introduced according to the macro flow of the narrative: exposition (easy to medium difficulty), rising action (medium difficulty), and climax (hard difficulty). Although this approach seems still rigid, it shows that narrative knowledge can go a long way to inform puzzle design.

CONCLUSION AND FUTURE WORK

In this paper, we explored the role of narrative puzzles in games. We focused on the ways of how narrative puzzles contribute to game storytelling and identified an initial set of functions. Though we are still building up our understanding, we have seen great potentials in examining puzzle design from a narrative perspective. Along the research direction presented in this paper, future work will include enriching the current catalogue of findings by exploring further into other genres. Despite our intention to research beyond adventure games, we only found a few examples of narrative puzzles outside the adventure genre in our first round of screening. Given more time and resources, we would like to explore more extensively across genres and identify the distinct, genre-specific puzzle characteristics. Lastly, we would also like to explore deeper from the player's perspective and discover more design implications along the psychological and emotional aspects.

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ENDNOTES

1 With respect to this characteristic, Karhulahti clarifies that “there are no kinesthetic puzzles but only puzzles with kinesthetic executions” (2013, 10).

2 Citing from Chris Chrawford and Greg Costikyan, Karhulahti differentiates dynamics and statics by the consequences of configuring them; that is: “in configuring statics, consequences are determinate; in configuring dynamics, consequences are indeterminate” (2014, 203).

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