Modeling Foreshadowing in Narrative Comprehension for Sentimental Readers

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Abstract. Foreshadowing is a narrative technique of manipulating the reader's inferences about the story progression. This paper reviews research on foreshadowing and reader comprehension in narratology and cognitive science. We use the term *sentimental reader* to refer to sophisticated readers who make active efforts in their reading experiences, and then we list various examples of foreshadowing found in novels, films, and games, discussing their impact on the sentimental reader's reasoning process. We further present an example of interactive fiction associated with the use of foreshadowing and conclude with future work.

Keywords: Foreshadowing, Narrative Comprehension, Reader Model.

1 Introduction

For decades narrative theorists have characterized the concept of foreshadowing from different perspectives. Narratologist Gerard Genette explains, on the basis of the story-discourse distinction, how story events can be differently re-ordered at the discourse level [1]. In his work, *telling in advance* (or *temporal prolepsis*) refers to situations where some future events are told ahead of time at the discourse level. This can be accomplished in two ways. The first, called *advance notice*, is direct and explicit, playing the aesthetic role of building anticipation for what is to come. This concept is similar to that of *flashforward* in film media, which shows some future events prior to the events leading up to them. The other type, called *advance mention*, describes indirect and implicit references whose importance may or may not be revealed later in the story. The notion of advance mention is close to that of foreshadowing in film [2], in that it works, for the most part, retrospectively. Genette also addresses the fact that the author can employ advance mentions in two ways - either falsely or genuinely, in order to fool the readers who believe that they can detect this narrative *seed*. Genuine advance mentions orient the reader in the right direction in relation to upcoming story developments; however, false advance mentions (or snares, to use Barthes's terms [3]) plant a wrong impression that leads the reader astray from the main story plot, thereby misleading the reader. As such, the mixed use of both types of foreshadowing in a story may challenge active readers who try to find and decipher hidden clues in the story.

H. Koenitz et al. (Eds.): ICIDS 2013, LNCS 8230, pp. 1–12, 2013.

Chatman [4] interprets foreshadowing as the seeding of an anticipatory satellite from which a kernel event can be inferred, where kernels refer to major plot events that serve as branching points directing a main path in the story plot, and satellites are minor plot events entailing no branching plot (or choice). Using this satellite-kernel relationship, foreshadowing can be characterized in two ways: a satellite event foreshadowing a later kernel event and a satellite event foreshadowing another, later satellite event. Chatman also claims that foreshadowing can evoke suspense. In suspense-entailing foreshadowing, the reader is given more knowledge about uncertain future events than the story characters, generating a disparity of knowledge between the reader and the characters. This knowledge disparity can lead to the creation of suspense for the reader at the discourse level, while generating surprise for the characters at the story level.

Some computational models of narrative generation have explored foreshadowing. A case-based reasoning system Minstrel [5] makes decisions about what to foreshadow and when to foreshadow (i.e., the story point where foreshadowing content will be located), based on the characterization of uncommonness and similarity of actions and states. Although their approach to selecting uncommon events was admittedly naïve, Minstrel made an attempt to increase story coherence and unity of a story. Montfort's Curveship [6] is an interactive fiction system with various formal narrative capabilities, including temporal re-ordering of events and focalization [1][7]. While Curveship does not support the function of foreshadowing directly, it can narrate some future events proleptically (based on the notion of Genette's prolepsis [1]) provided that a point of insertion and a rule for selecting future events are given. Curveship works on the basis of the temporal relations of events, not the causal information of them. The work of Bae and Young [8] presents a narrative generation system using the concept of Chekhov's Gun-style foreshadowing, where an important item or character is initially shown with hidden information. To best of our knowledge, no attempts have been made to analyze the reader's narrative comprehension with a specific focus on foreshadowing in a computational way.

To summarize, although foreshadowing is an effective narrative device influencing the reader's active comprehension of the story, little effort has been made in terms of investigating its operation. The goal of this research is to set the initial foundation for a *sentimental* reader's mental model while reading a story that contains foreshadowing in it. Sentimental readers (or critical readers) [9][10] refer to the readers whose reading process is modified by an awareness of aesthetic narrative techniques, and who are therefore able to grasp underlying story elements that are only partially shown. The remaining sections of this paper are organized as follows. In the next chapter we provides more detailed explanation about the two classes of the reader model. Various examples of foreshadowing found in classical media (including novels and films) and games are presented in chapter 3. Chapter 4 addresses a sentimental reader model and a possible example of the use of foreshadowing in interactive fiction. Chapter 5 concludes with discussion and future work.

2 Two Classes of Model Reader

A same story can be comprehended differently depending on the individual reader's cognitive and affective capabilities ddd cultural background of the reader. The text can be either underread (i.e., things present in the text are overlooked) or overread (i.e., things absent in the text are erroneously inferred), due to the gaps in the story [11]. While it is likely that individual reader has his or her own unique experience in reading, there have been attempts to classify readers into a number of classes. Umberto Eco theorized a distinction between the *naive* and the *critical* reader [9: p. 55]. The naive reader reads a text on purely semantic level, grasping only its literal and referential meaning without any perspective on how (or why) this meaning is constructed by the text. The critical reader, on the other hand, reads not only the semantic meaning of the text, but also gains an awareness of the formal and aesthetic techniques by which that meaning is conveyed. Eco argues that a text can be structured in such a way that it anticipates two model readers, a naive and a critical one, and that, as such, it can be read on two levels. A mystery story, for instance, might be read by a naive reader who enjoys being unwittingly carried along by the devices used by the writer to create suspense, fear, and surprise. A critical reader might read the same story and gain an appreciation, not only for the content of the story, but for the formal techniques and narrative strategies that the writer uses to create the story's effect.

In a similar vein, novelist Orhan Pamuk draws on a distinction made by the philosopher Friedrich Schiller, suggesting that literature can exist – both in its production and in its consumption – in two different modes: the *naive* and the *sentimental* [10]. Similarly to Eco, Pamuk describes the naive reader as a reader who understands text as an unproblematic representation of external reality, while the sentimental reader understands the mediated nature of the text's representation. The sentimental reader, therefore, is sensitive to interpreting not only what is said but also how it is said. Both theories of Eco and Pamuk reveal the extent to which the reader is an active participant in the activation of the text's signification.

The reader's process of reading narrative has been also investigated in cognitive science and psychology. Cognitive scientists Gerrig and Bernardo [12] view the reader as a problem solver who constantly tries to find the solutions available to the protagonist to achieve a given mission or to survive. Their theory claims that the reader feels more suspense as the potential solutions available to the protagonist are eliminated [12][13]. As a mental representation of a story constructed by the reader, Zwaan [14] suggests an event-indexing model consisting of space, time, goals (and causation), and characters (and objects). Based on these dimensions, the reader builds *a situation model* as if she herself is in the situation depicted in the narrative text. This generic model has been employed as a reader model to keep track of the reader's inferences in narrative comprehension [15][16]. Trabasso et al. investigate the causal relationship among story events as the key to understanding story recall [17], where the greater the number of direct causal connections a story event has, the more readily it is recalled; the more readily an event is recalled, the more significant it is considered.

3 The Use of Foreshadowing in Media

3.1 Foreshadowing in Novels and Films

In Stephen King's novel 11/22/63, the protagonist Jake recounts, commenting early in the story, “I wish I had been emotionally blocked, after all. Because everything that followed - every terrible thing - flowed from those tears." This kind of *advance mention* prepares the reader for anticipating fearful and tragic events that are about to happen as the story unfolds. This also helps the reader maintain a sense of curiosity and desire to finish reading the story (even through sections where it might be comparatively dull). In *The Alchemist* by Paulo Coelho, the shepherd boy Santiago consults a fortune-teller about his recurrent dream. In the dream a child leads him to the Egyptian Pyramids to show where treasures are located, but he wakes up before knowing the exact location. This dream drives him to embark on a long journey, at the end of the story, to Egypt where the scene in the dream is actually realized.

In the film *Life of Pi* (directed by Ang Lee, adapted from the novel authored by Yann Martel), the young boy Pi meets a priest in a chapel while drinking holy water. The priest gives him a glass of water, saying, "You must be thirsty." The audience also learns that the tiger Richard Parker was initially named *Thirsty*. As the story progresses, Pi recounts his 227-day journey on the sea, struggling with the tiger while they share a small lifeboat. At the end of the story, however, when Pi provides a fabricated story to the Japanese officials who are investigating the shipwreck, a sentimental reader may comprehend that the story told so far was an allegory of an underlying story in which Pi himself was the tiger - a revelation foreshadowed by the earlier link between Pi and the tiger.

Genuine and false foreshadowing can be mixed together - that is, foreshadowing can be partially genuine and partially false. For instance, in Martin Scorsese's film *Hugo* (2011; adapted from the novel *The Invention of Hugo Cabret* written by Brian Selznick), the sentimental reader can recognize at least two different types of foreshadowing. One is the main character Hugo Cabret's talent to unlock a door. Hugo first demonstrates this skill when opening a theater door to watch a movie with a girl named Isabelle. Later, at the climax of the film, Hugo uses this skill to escape from a cage. This is an example of genuine foreshadowing, using the plot device known as *Chekhov's gun*, where a seemingly unimportant object or person introduced earlier in the story turns out to play a significant role in the plot. Another case of foreshadowing in the film is Hugo's dream about a train crash. In the dream, Hugo is on a train track and picks up a key that is necessary to operate the automaton. Suddenly a train approaches down the train track and presumably hits Hugo. Later in the film, a similar situation occurs. This time Hugo is on the train track to pick up the automaton itself, not the key. The train approaches as it did in his dream, but someone saves Hugo right before the train hits him. This can be considered as genuine foreshadowing since the actual situation plays out almost identically to its foreshadowing manifested as a dream. It is also false foreshadowing in that some important details and events are opposite to the reader's expectations. When the train approaches in the latter scene, moreover, the audience can feel suspense due to its foreshadowing in Hugo's dream.

In the film *In Bruges* (directed by Martin McDonagh, released in 2008), a hired assassin, Ray accidentally kills an innocent little boy while on a mission to assassinate a priest. Ray and his partner Ken are ordered by their boss Harry to keep a low profile in Bruges, Belgium. Soon, Ken is given the task of killing Ray as punishment for the boy's death. When Ken refuses to do this, Harry makes a verbal commitment that he would commit suicide on the spot if he were to kill a child by mistake. And then, at the climactic scene of the film, when a similar situation appears to happen to Harry, the (naive) audience understands Harry's decision to kill himself. Furthermore, it is highly likely that the sentimental audience would have predicted Harry's suicide before the incident, and, indeed, may have expected the situation far earlier, when Harry's verbal commitment was made. Here, foreshadowing serves as predictor of a character's future incident or destiny for sentimental viewers, and as persuasive device for naive viewers later in the story [18].

In the Korean movie *Helpless* (directed by Young-Joo Byun, released in 2012), a seemingly mundane dialogue between two supporting characters plays out as a critical clue to the prime suspect's whereabouts later in the film. A regular moviegoer may find this scene abnormal because the short conversation, which appears to be unrelated to the ongoing story, is shot in great detail. When it turns out that one of the characters in the scene becomes the target of the future crime, the audience can establish a strong causal relation to the conversation shown in the beginning.

3.2 Foreshadowing in Games

Given that digital games are perhaps best considered a hybrid form - entertainment software that "contains many forms of media content" [19] - it is hardly surprising that foreshadowing can become an element in the game designer's vocabulary. Moreover, due to the capacity of games to deploy the medial characteristics, formal properties and cultural codes of media such as literature and cinema, it is inevitable that the techniques of foreshadowing that are brought into play will, to a considerable extent, mirror those found in earlier media. For example, in Journey[1], a game that structures itself as a spiritual quest, a hieroglyph seen in an early video cut-scene foreshadows the death of the player-character at the end of the quest.

The potential for a new dimension of foreshadowing, however, might reveal itself once the specific formal properties that differentiate narrative in games from that in other media are brought into the equation. First of all, it is only possible to speak of foreshadowing in respect to the category of digital games that Juul defined as progression games – games that are structured around a "predetermined sequence that the player has to perform to complete the game" [20: p.158]. Since foreshadowing as a narrative structure requires the presence of at least two events – the foreshadowing event and the foreshadowed event, with the former preceding the latter in presentation – only a game which is to some degree structured around a linearly-organized progression of events can ensure the presentation of both events in the correct sequence to the player. Even within games of progression, one of the recognized challenges of

[1] Thatgamecompany, 2012. http://thatgamecompany.com/games/journey/

applying the notion of narrative to games is that, unlike in other narrative media, it is problematic to conceive of a game narrative as the representation of a fixed sequence of events: it is perhaps more accurate to think of games as spaces of possibility out of which the player can actuate a unique sequence of events. In light of this, Calleja coins the term *alterbiography* to refer to "the story generated by the individual player as she takes action in the game" [21: p. 115].

Narrative in games, then, is best understood as an alterbiography, a sequence of events or actions actuated by the player (albeit most likely determined to a great extent by a pattern set in place by the designer). In this context, the foreshadowing of a narrative event that requires the player to perform a specific action or set of actions can serve as a powerful tool by which the player may be guided towards the relevant ludic action for furthering the game state, and, by extension, actuating the foreshadowed event. A particularly succinct and explicit example of this form of ludic foreshadowing can be found in the Flash-based game *You Have To Burn The Rope* [2], which consists of a tunnel leading into a single chamber in which the player-character has to defeat a boss character. A brief exploration of the chamber leads to the discovery of a path leading to a high platform, where the player can see a chandelier hanging over the boss character, and a series of flaming torches that can be picked up and carried. In this case, the solution to the puzzle has been doubly - and explicitly - foreshadowed; first, in the name of the game itself, and second, in a series of instructions that are laid out on-screen as the player-character is traversing the tunnel that leads to the boss chamber. The first two messages – "There's a boss at the end of this tunnel" and "You can't hurt him with your weapons" lay out the situation that is awaiting the player in the next scene; the third – "To kill him, you have to burn the rope above" – reveals the action that the player has to perform in order to resolve the scene. In effect, then, both the upcoming task and the solution to the task are explicitly foreshadowed, and the task of the player is simply that of performing the foreshadowed event.

You Have To Burn The Rope plays its foreshadowing to comedic ends, overstating the point to such an extent that there is no longer any puzzle to solve at all, with the game having intentionally given itself away. *Portal 2* (Valve, 2011) might provide us with a more nuanced example of this form of ludic foreshadowing. The core mechanic of the game lies in using the player-character's portal gun to create portals on available surfaces, thereby solving spatial puzzles through the linking of two separate points in space. The player, however, is not able to create a portal on any given surface in the game. Only certain surfaces – usually marked by differences in texture – are 'portalable'. Later sections of the game introduce a new element – conversion gel – that can be spread onto a non-portalable surface to make it portalable. In the game's final scene, the player finds herself confronting Wheatley, a rogue artificial intelligence construct, in an encounter that reflects the conventions of the climactic digital game 'boss encounter'. The only evident portalable surface is a panel right below Wheatley's robotic body, but, without a second usable surface on which a

[2] Ken Bashiri, 2008. `http://www.kongregate.com/games/Mazapan/you-have-to-burn-the-rope`

complementary portal can be created, there seems to be no evident action available to the player to extricate herself from the situation. At this point, an explosion opens a hole in the ceiling, through which the moon is visible in the night sky. Since the entirety of the game to this point has taken place in a vast series of underground chambers that the player-character is trying to escape from, this reveal of the night sky carries considerable dramatic weight. Its significance is underlined in Wheatley's threat to the player-character: “Take one last look at your precious moon. Because it can’t help you now!”

The observant player, however, will be drawn to recall a number of references to the moon throughout the course of the game. Some of these are implicit: a landscape painting in the first room of the game changes, on a second viewing, to reveal an oversized moon hanging over the scene, and a number of concealed, ‘secret’ chambers throughout the course of the game contain graffiti relating to the moon, such as diagrams of the lunar cycle. More explicitly, in one of the many audio recordings that the player hears throughout the game, Cave Johnson, the founder of the company responsible for the facility in which the game takes place, describes the invention and development of the aforementioned conversion gel, revealing a material connection between it and the moon: moon rock, it seems, is the raw material out of which the gel is produced. The effect of these multiple points of foreshadowing, when it comes to the final confrontation, is twofold. First, recalling these earlier references to the moon signals to the player that the moon's appearance in this scene is important. Second, the connection between the moon and conversion gel invites the player to reach the conclusion that the moon, as an entity within the gameworld, might possess the same mechanical property as the conversion gel. It might, in other words, also be a portalable surface, and, as such, it might provide exactly what the player needs to solve the given puzzle. In this way, the foreshadowing of the scene provides the player with the information she requires to perform the correct ludic action: by launching a portal onto the moon that connects with the portal beneath Wheatley, the boss character is sucked into space, and the situation is resolved.

3.3 Discussion

Foreshadowing is a narrative device by which the author intends to influence the reader's temporal or chronological reasoning about the story in some ways. The functions of foreshadowing are diverse. It serves to maintain the reader's curiosity throughout the story in *11/22/63*, to increase the postdictability (i.e., making sense of the story as a whole in retrospect [22] in *Hugo* and *The Alchemist*, and to strengthen retrospective coherence in *Helpless* and *In Bruges*. The use of foreshadowing in games is problematic, for the foreshadowed events can vary depending on the player's action. A prevalent function of foreshadowing in games (*You Have To Burn The Rope* and *Portal 2*) is to provide the player with *narrative affordances*, a term used in [23] to describe “artifacts (specifically, story events) which prompt mental structures that allow players to envision intuitive outcomes to the current story.” Our work focuses on the type of foreshadowing used to build retrospective coherence in novels and films, and to serve as narrative affordances in games.

4 Sentimental Reader's Narrative Comprehension on Foreshadowing

4.1 Foreshadowing and Possible Worlds Theory

When consuming stories, sentimental readers can detect foreshadowing events when a particular scene (usually a satellite event) stands out. For instance, a cinematic long-shot fixated on an object hints at the potential usage of this object in the upcoming story. A dialogue between minor characters can be noticeable when its content (which is seemingly not related to the current story progression) is clearly heard. While these kinds of discourse-level foreshadowing techniques are an interesting topic, this research focuses on the detection of foreshadowing at the story level. More specifically, we are interested in the analysis of causal connection in story as a key to detecting foreshadowing events.

The reader model of narrative comprehension in our work also draws on Possible Worlds theory [24][25]. The theory was initially originated from semantic logic [26] and has been adopted to explain the reader's mental activities while reading texts [24][25]. The concept of possible worlds refers to any world that can be accessible via modal operations such as inference, imagination, desire, dreaming, hallucination, foretelling, promising, obligation, or storytelling within stories [27]. Possible worlds can be constructed by the author, the characters in the story, and the reader. In Possible Worlds theory, the story world clearly described in the text is called Textual Actual World (TAW). Due to gaps in the story the reader tends to build multiple story worlds in her mind as long as these stories are not contradicting the TAW. Drawn from this theory, the reader model in our research is deemed to maintain multiple possible stories unless the story progression reveals the opposite situations.

Figure 1 illustrates the sentimental reader's reasoning process regarding the detection of foreshadowed events, based on the film *In Brouges*. The box containing events represents a story, wherein the story begins from the leftmost cell. The reader model, given the initial and the goal state of the story, builds partial stories as the story unfolds. When a foreshadowing event (in the example, Harry's promise of suicide) is presented, naive readers would simply consider this as a part of the story. The sentimental readers, however, can understand this as a hint of future events (step 1: Detection) and immediately construct a partial plan containing the additional goal state (i.e., Harry's death) and some predicted steps leading up to it (step 2: Build partial PWs). We believe that multiple possible worlds can be built, some of which are eliminated as the story unfolds. When the reader reaches a point at which critical information is revealed, as in step 3: Activation (i.e., midget's death by Harry's shooting), the reader can infer some future events leading towards the foreshadowed ending (step 4: Build complete PWs). In the movie, Harry, who promised to commit suicide on the spot if he kills an innocent child, mistakes the dead midget in children's wear for an actual child: believing himself to have killed a child, he keeps his earlier promise by killing himself.

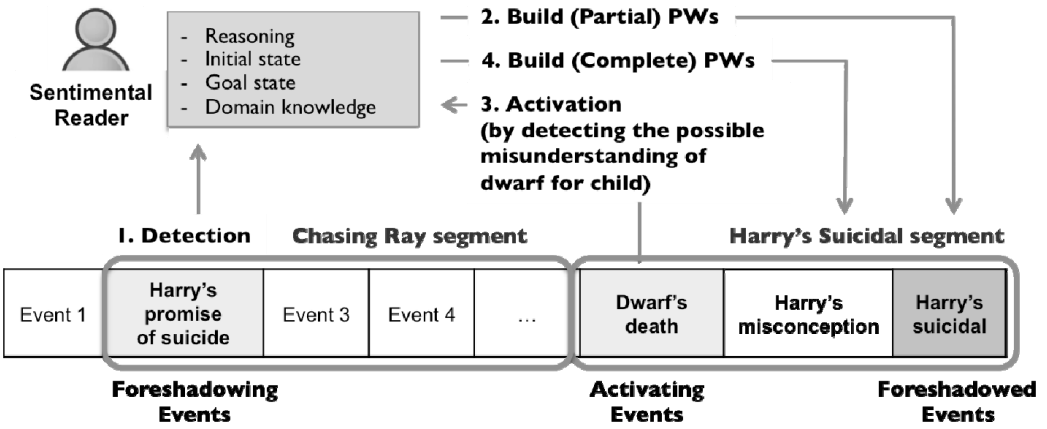

Fig. 1. Foreshadowing and Foreshadowed events in story progression. An example of the film *In Brouges* was used for illustration. Although a single possible world (PW) is illustrated in this figure, multiple possible worlds can be formed depending on the reader's reasoning capabilities.

The reader model shall have the functionality of tracing what the reader will infer when a foreshadowed situation occurs, given foreshadowing. Depending on his or her reasoning capability and preference, each reader may infer differently for the same foreshadowing. This happens because the reader does not have access to the author's complete story world (or fabula) [28][29][30], and some important information can be omitted intentionally by the author for a particular effect (e.g., surprise and suspense).

4.2 A Design of Foreshadowing in Interactive Fiction

As mentioned in previous sections, foreshadowing, by providing the reader with narrative affordances [23], can serve as a seed for building different possible worlds. Interactive fiction, where different endings and plots are possibly selected by the reader, is an interesting domain in this vein because the story designer can use foreshadowing to guide the player to experience specific emotions – such as suspense, surprise, curiosity, empathy, emotional identity, etc., which are crucial to understanding the reader's emotional experiences while reading a story [31].

We are currently designing an experimental study with a text-based interactive fiction in order to test how foreshadowing can influence the reader's choice of story progression, and eventually to test how this experience can contribute to the reader's overall enjoyment of her reading experience. As a story material, we adopted a modern Korean short fiction, *A Lucky Day*, written by Hyun Jin-geon in 1924, which is about what Kim, a very poor rickshaw driver, experiences in a day. On a rainy morning, when Kim is going out to work, his sick wife asks him not to leave her alone. But Kim doesn't hesitate to leave because he desperately needs money to buy daily food for his family. On that day Kim makes enough money to buy a beef-and-rice soup for his sick wife, which she wanted to eat so much from several days ago, a big bowl of rice soup for his three-year old son, and even a few drinks for himself. At that moment, a passenger calls for him and wants to go long-distance with paying ridiculously much money. Kim hesitates due to his sick wife lying at home but agrees to go, thinking to himself that this is not an everyday luck. On his way back home he stops by a pub and gets drunk, trying,

but in vain, to forget the bad feelings about his wife. Finally Kim arrives at home with a beef-and-rice soup in his hand and finds out his dead wife.

As the original novel is written using the omniscient third person perspective with the focalization of Kim, the reader can see the situations through Kim's perspective. Foreshadowing in the novel is often manifested by the advance mention [1] of the omniscient narrator about the coming tragedy – for example, "As he approaches his home, Kim feels relaxed in a strange way. This relax does not come from the relief but from the desire of delaying to know every detail of coming misfortune."

In the interactive version we are designing different endings with various plots, which will be explored by the reader through Kim's perspective. Kim's wife, depending on the reader's choice, is either dead or alive, and foreshadowing is given in two ways – either genuine or false – depending on the reader's choice and the predefined ending. A simple example of interactive design of the story is given in Figure 2, where the reader can choose her own path. If the reader decides to come home earlier before going to the South Gate, she may have a chance to save the life of Kim's wife. The foreshadowing, either genuine or false, can be given to provide the reader with the emotion of suspense or surprise. We are also designing various realization of foreshadowing. For example, associated with the death of Kim's wife, Kim has a daydream of his wife's death while taking a short break; one of his passengers talks to Kim about his dead mother when he was young; Kim sees two dead birds in the street – one is big and the other is small. As for the foreshadowing associated with positive ending (i.e., Kim's wife is alive), the opposite situations would be possible.

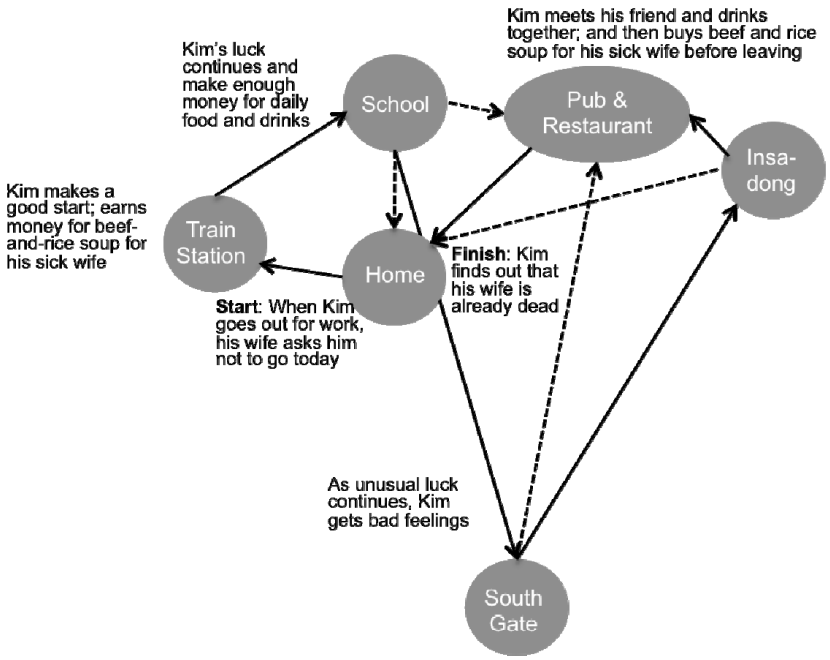

Fig. 2. A design of interactive fiction based on a South Korean short novel, *A Lucky Day* (1924), where the circles represent the main locations in the story; the solid line refers to the main character Kim's temporal and spatial movement in the original story; the dashed line refers to possible branching or detour in the interactive fiction version.

5 Conclusion and Future Plans

In this paper we have explored various cases of foreshadowing in narrative and games, proposing a use of reader model that represents the class of sentimental readers (as defined in [9][10]) under the assumption that these readers are able to detect the use of foreshadowing in narrative. Our research draws upon narrative and cognitive science theories, as well as insights obtained from examples of foreshadowing found in novels, films, and games.

The present work describes the initial steps taken towards the understanding of foreshadowing in narrative both from the reader's and the story designer's point of view. Based on various usages of foreshadowing and relevant narrative theories, we are designing an experimental study to evaluate how different types of foreshadowing can influence the (sentimental) reader's expectation and choice of the story progression in interactive fiction. We expect that our studies will be beneficial to the design of the drama manager and the reader model in interactive storytelling.

We also have a future plan to include discourse-level foreshadowing, using background music and/or lighting in order to manipulate the intensity of foreshadowing (i.e., how explicit or implicit the given foreshadowing is), as well as the use of foreshadowing in differently focalized story (e.g., exploration of the interactive fiction of *A Lucky Day* through the eyes of dead Kim's wife).

Acknowledgements. This work has been supported in part by the EU FP7 ICT project SIREN (project no: 258453).

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