

Chapter 2

Serious Storytelling: Narrative Considerations for Serious Games Researchers and Developers

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ABSTRACT

*In this chapter, the authors explore the nature and function of storytelling in serious games. Drawing from the field of narratology, they explore research related to narrative expression and relate those ideas to serious game design and development. They also consider interactive storytelling and apply and adapt traditional ideas about story as a static and predetermined entity into this new setting, a setting which depends in part upon gamer participation to craft dramatic experiences. The authors conceptualize narrative as a combination of plot, character, and environment, and then use that conceptualization to devise a narrative taxonomy that is useful as a heuristic for developing stronger stories in serious games. The chapter concludes with an analysis of the hybrid FPS/RPG game *Fallout 3*, an analysis included to show that even highly regarded and award-winning games are lacking in the narrative coherence necessary to improve the level of dramatic immersion in virtual worlds.*

INTRODUCTION: GRENWIN THE GOBLIN

You are still enjoying your newfound fame as slayer of the great white serpent (and the popularity this earned you with the townfolk of Eleven Isles) when chaos suddenly erupts in the Rusty Hinge tavern.

Grenwin the Goblin hacks down the door with a rusty axe and crashes into the room. Patrons scatter, shrieking in terror, as the wiry green beast swings the axe about carelessly, smashing flagons of ale and overturning tables, all while cackling maniacally and searching the room for something to steal or devour. If he sees you, all is lost, for he must know it was you who stole his clan's map to navigate through the forbidden mountains. You

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duck down from your position at the far end of the darkened room, hoping to avoid detection. Alas, it is no use. Grenwin apparently has excellent eyesight. The abomination trains his beady eyes on you. His eyes narrow as he recognizes you and he smiles cruelly. You panic as the goblin reveals a surprising burst of speed and streaks across the pub in your direction. If only you could remember Pythagoras' theorem and calculate the correct trajectories, you would let loose a flurry of virtual arrows and fell this foul creature. As it stands, not having prepared as instructed by Zorak the Bard, you must defend yourself with your untrained peasant's hands and hope for the best...

This paragraph might describe a scene taken from any number of fantasy based role-playing games (RPGs). Though primitive and brief, the example above is also narratively complete. It contains a protagonist: the character controlled by the player. There is a goblin antagonist to provide conflict and there is an environment in which the action is anchored. There is also a plot, albeit a brief one: escape from the pub with your life and wits intact. The central concern of the player is to apply whatever knowledge she has in order to survive the ordeal at hand and then venture out into the fantasy world to continue her adventures. The fact that the paragraph above just happens to be useful for a serious game to teach trigonometry is largely irrelevant. Stories are equally important for serious and non-serious games alike. What is most important is that the game's story offers a chance for the player to project herself into the character of a virtual heroine that is facing an attacking goblin.

Using gaming or simulation parlance, we might call this phenomenon *immersion* or discuss it in terms of *presence* – the replacing of real world cues with virtual cues in successfully crafted fantasy environments. In psychological studies of narrative, it is more specifically known as *narrative transportation* (Green, 2004) when

restricted to the influence of the narrative dimension of a system. In this brief and intense moment, the player *becomes* the young heroine, and the story and gameplay merge together as a vehicle for transportation from a real to a virtual identity. The goal of serious games is to create a virtual environment in which this pathway is reversed; by encountering and solving problems in the game world, the player learns skills and builds knowledge useful for problem solving in the real world.

While complete in a narrative sense, the problem with the story of Grenwin the Goblin (which is one of a thousand narrative instances we might extract from an RPG) is that the learning moment used here causes incongruence with the overall story. The learning objectives, which focus on knowledge of the Pythagorean Theorem, do not align with the dramatic objectives, which should showcase the intense, adrenaline-filled process of escaping from a tavern while engaged in battle with a ferocious goblin. Further, the player's actions may serve to further undermine the dramatic quality of the action. She may choose to simply give up, allowing the goblin to tear her avatar limb from limb, or she may decide to take advantage of the pathfinding limitations of the enemy artificial intelligence and find a way to "cheat" the system by standing one step behind the goblin's reach and delaying the conclusion of the scene indefinitely. The inconsistency between the game's story and the game's learning content can be a debilitating problem when trying to motivate players to keep playing and learning. While we cannot always control the actions of the player or the way she plays the game, we *can* adjust our storytelling technique to better align our learning objectives with our dramatic objectives.

As this example illustrates, interactive storytelling is an important craft for serious game developers to understand. When done correctly, storytelling can aid in the game design process in several ways. A strong narrative can improve player motivation by encouraging the player to

continue playing in order to resolve the undisclosed elements of the story and explore the nooks and crannies of the game world. Stories can embed learning objectives within the game objectives by positioning the acquisition of learning materials as an active part of quests or missions. Finally, strong stories can tie together various game elements such as artwork, sound, character interactions, gameplay mechanics, and environmental processes into a coherent framework that makes the information presented within the virtual world easier to absorb. As such, storytelling is a very powerful tool that lies within the serious game developer's toolbox.

Despite its usefulness, the narrative form remains elusive to game developers and academics alike. It is both complex and multifaceted, and its study has inspired an entire line of research devoted to better understanding it, the field of inquiry known as narratology, also described as the "science of narrative" (Onega & Landa, 1996, p. 1). Scholars interested in the form and function of stories have considered the nature of narrative for the past several decades; in this chapter, we maintain that there is much important information in this body of work which can be used to improve the narrative aspects of serious games. As game designers and developers, we can use the same critical vocabularies, theories, and taxonomical techniques that have long been established in the field of narratology. While these techniques may require a good deal of revision—due to the interactive, nonlinear nature of video games—they can at least provide a starting point for thinking about game stories using established conventions.

As a first step in this direction, we consider two different ways of conceptualizing serious storytelling: as a theoretical construct and as a subject of critical analysis in existing games. Each of these two perspectives is important for different reasons. On the one hand, the serious games developer may need to consider practical ways for improving storytelling to improve player

immersion and motivation. These techniques can be analyzed through the critical analysis of existing games. On the other hand, the serious games researcher might be looking for a way to study narratives in order to gather empirical support for embedding a particular type of story in a particular type of game; a theoretical starting point is important for this type of task. Finally, a recognition that even bestselling and award-winning commercial games fall prey to narrative problems is useful for all audiences as this shows we still have a long way to go to bring interactive story up to the same polished level as other aspects of contemporary games—such as the quality of gameplay mechanics, physics handling, audio and visual fidelity, and so forth.

To address these issues and frame these two perspectives, we first provide an introduction to the field of narratology for non-narratologists. After this initial review, we construct a basic taxonomy for interactive narrative that is useful for thinking about the various ways of creating and studying the narrative experiences found in serious games as theoretical constructs. For our second perspective, we examine the current state of interactive storytelling by performing a brief narrative analysis of a popular commercial title, which we argue is also an example of a compelling framework upon which to build a serious game. Using the video game *Fallout 3* as our subject in this analysis, we study the storytelling techniques used by commercial game development companies in order to illustrate the various elements of narrative in an operational fashion. This analysis suggests that while interactive storytelling in games has made much progress over the last several decades, we are still seeing many types of narrative problems that prevent our players from experiencing fully congruent narrative worlds. We conclude this chapter with thoughts for the future of interactive storytelling as a means for improving serious games. As a brief demonstration of applying the ideas from this chapter to a real game, we suggest several

ways in which we might improve our introductory story about escaping from a bloodthirsty goblin while learning basic geometry.

SELECTED NARRATOLOGICAL PRINCIPLES

While narratology itself is a rich field of study characterized by subtlety of analysis and debates concerning the function and nature of narrative in various genres of stories, there are also some major themes and ideas which we can extract and appreciate as being useful for the design and analysis of serious games. In particular, it is useful to have knowledge of some of the basic terminology used in the field and to consider some of the techniques and approaches to narrative structure and narrative taxonomy that have been important in this line of research. This knowledge provides us with some established vocabularies and frames for considering existing serious games and their successes and failures as vehicles for game-story expressions. These ideas can also be useful in constructing preliminary empirical studies to further analyze the effectiveness of story as a scaffold for learning (or as a mechanism for improving immersion through narrative transportation) in serious games.

As much narratological theory emerged from the structuralist perspective, a field of literary study which maintains that stories can be coded, compared, and classified by their structural units, there is a rich history of structuralist work that has value for serious games practitioners and researchers. If we conceptualize serious games as engineered systems that solve problems in particular domains, then, following the structuralist tradition, we can also consider the ways in which stories can serve as modular parts within those systems. Alternately, if we consider serious games from the humanist's perspective, we can appreciate the ability of stories to provide insight into the human condition and to perhaps provide scaffolds for reaching the

“gray areas” of tacit instruction that are not easily taught using learning objectives and engineering design guidelines. Sheldon (2004) expresses this sentiment in terms of affective impact, writing, “if we would like to involve emotions higher than an adrenaline rush, we need to reach the human spirit, not just endocrine glands” (p. 6). Stories can leave a lasting impression of a virtual world long after the gameplay has ceased.

For example, in a serious game designed to teach art history in the Renaissance, some learning objectives might target players' recognition of selected artistic works as recreated in a virtual world. This type of instruction can be embedded into a game without the need for even a minimal story; players match works with titles and are rewarded for successful pairings. Now, consider the same artwork when placed in a narrative gaming environment. This interactive experience is crafted with numerous NPCs and uses a plot involving an up-and-coming artist named Nichola and his quest for legitimacy in 15th century Italy. The player takes control of Nichola in the year 1435, in Florence. The game begins in the church of Santa Maria Novella; after a brief cut scene introduction of Nichola's wife charging him with locating his mentor in order to begin his daily lesson, the player is given control to explore the church and its surrounding artwork. He soon discovers the prominent *Holy Trinity*, a 25 foot tall and 10 foot wide fresco created by the recently deceased painter Masaccio. Later in the game, upon finding Nichola's mentor, the techniques used in the *Holy Trinity* are explained to him through dialog. A minigame then allows him to practice his shading techniques in order to master that targeted skill and improve Nichola's reputation as an artist.

In this type of game, the player sees the artistic material from the context of the story; the fact that Nichola must recognize and master existing styles in order to mature as a painter teaches other, more subtle lessons about Renaissance artistic practices. These are lessons involving traditional

training techniques, artistic styles, the integration of architecture and art in fresco works, and even politics (one NPC standing outside the church explains that Masaccio's work was influential to Michelangelo; another suggests the great painter was poisoned by a jealous rival painter, which leads to another quest to collect clues related to his death). With this type of narratological massaging, a serious game can draw a player *into* that world through narrative transportation. He participates in dramatic moments that are carefully chosen to explore the artistic themes of the period and observes the importance of art on the surrounding community of Florence. To be able to recognize important works of art is important, but understanding the cultural and social implications of that art on a Renaissance community serves unstated learning outcomes that may augment the primary learning objectives in unforeseen ways. Even building a modicum of artistic skill through integrated minigames linked to the overall story is possible; these ancillary results can be served through strong storytelling techniques paired with creative gameplay mechanics.

Supporting such grand constructions is not easy. This is in part due to the density of the narrative form. It is the aim of this chapter to partially demystify narrative and to deconstruct it into a set of constituent parts that can then be rearranged for various pedagogical purposes. First, let us consider stories conceptually, using the lens of narratology. Narratology is a term defined by Tzvetan Todorov to refer to the theory of narrative as an academic pursuit. As Prince (2003a) notes, narratologists are concerned with the general study of narrative in terms of its nature, form, and function, and specifically with "what all and only narratives have in common (at the level of story, narrating, and their relations) as well as what enables them to be different from one another" (p. 66). Elsewhere, he notes the theoretical impossibility of defining such a field under a single conceptual model, writing that while "some theorists and researchers believe that everything is narrative; others

maintain that everything can be; and still others contend that, in a sense, nothing is (because narrativity is culture-dependent and context-bound)" (2003b, p. 1). Nevertheless, despite the complexity of this expressive mode, there are some ideas we can apply to help better understand the nature of narrative in serious games. First, we can consider the difference between a story and the expression of that story in a particular medium. Narratologists generally distinguish narrative, or the process of telling stories using particular media through an "expression plane," from story, or the "content plane" of narrative (Prince, 2003b, p. 93). Narrative in this sense is perhaps most simply defined by Abbott (2002) as "the representation of an event or a series of events" (p. 12). Important here is the word representation, which further distinguishes the term *narrative*, a specific instance of story, from the term *story*, a generic sequence of events with the potential for narrative expression through media. Collectively, these sequenced events constitute the plot of a story.

Next, we can consider stories structurally. Story plots are composed of a series of events which are related both casually and temporally. Mateas (2001) notes that dramatic stories can be represented along two axes, with a vertical axis used to represent tension and a horizontal axis used to represent time. Moving from left to right across the horizontal axis, one sees a general exposition, a period of rising action characterized by an inciting incident and a crisis, a climax, then a period of falling action culminating in the denouement, or the final unfurling of tension. Aristotle originally provided this treatment of story classification more than 2000 years ago in his *Poetics*; here he provided the most basic distinction between plot types based on the final situation of the hero or heroine. As Booker (2005) explains, in a tragedy, the hero or heroine originally seemed destined for fortune, but there was an eventual disaster at the end of the story leading to catastrophe. In a comedy, complications are introduced early on for the hero or heroine, but by the end of the story,

these complications are resolved and the major characters are liberated or redeemed. Booker continues to outline additional canonical plot types such as “overcoming the monster,” “rags to riches,” “the quest,” “voyage and return,” and “rebirth” (pp. 17-215). The Hero battling Grenwin the goblin is currently engaged in an *overcoming the monster* plot, while Nichola the struggling artist is on a *quest* plot which may eventually lead to his *rebirth* as an esteemed artist. Nichola’s tale may also end as a *rags to riches* plot type, with his newfound reputation as a skilled artist bringing his family fame and esteem. Each of these causal event sequences has various identifying features that enable them to be used in a variety of stories and undergo a variety of transformations and adjustments.

This classical narrative plot structure was further shaped by the German critic and novelist Gustav Freytag in 1863 (Jacobs, 2007). As noted by Meadows (2003), Freytag also charted time along a horizontal axis and plot along a vertical axis, resulting in a pyramid or triangular shape (this structure has come to be known as Freytag’s pyramid, or Freytag’s triangle). During the first portion of a dramatic story, *desis*, there is a period of rising action, during which tension is introduced and elevated. At the *climax*, or center of the triangle, this tension is at the highest possible level. Then, a reversal of circumstances occurs at the *peripeteia* stage. Finally, during the *denouement*, the tension is released and the story is resolved.

Perhaps more relevant to the structure of serious game stories are the ideas about story that have emerged from the genre of filmmaking. Since many early game stories were told through cut scenes using filmic conventions, proven scriptwriting techniques offer another approach to thinking about the structure of game plots. For example, the work of screenwriter Syd Field offers a formula for building narratives suitable for the screen; in this formula, a three act structure is used to break a story into specific parts (Jacobs, 2007). In the first act, the mood and tone are established and the hero

or heroine is introduced. During the second act, confrontation occurs, eventually reaching a climax in which the primary character faces an extreme obstacle. In the third act, the tension is resolved and the hero is either successful or ultimately fails in his journey. Most interesting in Field’s model is the fact that minutes of screen time correspond directly to the number of pages in a script, which is useful since Act One and Act Three are roughly thirty minutes each and Act Two is sixty minutes. This suggests an appropriate technique for creating a dramatic primary story in a game might be to use 1/4 of the game for setting up the initial situation, 1/2 for throwing major obstacles at the player, and then a final quarter for wrapping up the story and rewarding the player appropriately. A more detailed example applying Field’s three act structure to the film *Star Wars* can be found in Jacobs (2007).

Finally, we can consider stories thematically. In this sense, we organize stories according to their functional characteristics and the relationships formed by various story events. Because of their (relatively) simple structure, fairy tales were often studied as examples from which to devise taxonomies for narrative units and the relations between them. The seminal text *Morphology of the Folktale*, published by Vladimir Propp in 1968, outlines a structuralist approach to the taxonomy of themes and structures present in Russian fairy tales. Morphology refers to the study of forms, and Propp notes in his opening chapter that a traditional way of classifying between narrative forms has separated fairy tales based on content: fantasy stories, stories about everyday life, and stories about animals. But, as he notes, this distinction can be problematic as the content from fairy tales inevitably blurs boundaries (tales with both animals and fantasy elements are common, for example). To counter this problem, Propp suggests a more comprehensive regimen of classification relying on morphology, or using “a description of the tale according to its component parts and the relationship of these components to each

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other and to the whole” (p. 19). A morphological approach makes it possible to separate story types by the actions that occur rather than by the overall nature of their subject matter, which can be somewhat ambiguous.

Using a morphological strategy, it is possible to classify fairy tales based on their functions, or the actions of characters and the significances of those actions for the overall plot. Propp notes that these functions are the fundamental, stable units from which fairy tales are constructed and affirms that there are a limited number of such functions which can be articulated and studied in relation to one another. Later, he outlines a series of functions of the *dramatis personae*, or the overall cast of characters within a tale. In general, Propp notes that fairy tales follow this structure. First, an initial situation is presented and the members of a family and the hero are introduced (this introduction is not one of Propp’s functions, but is important nonetheless). Then, a series of functions define how various tales can develop from the same general stockpile of plot elements. For example, the initial situation is followed by the preparatory section which then leads to a complication often involving villainy or the hero’s recognition of a lack or absence of some sort. After the complication, donors will provide aid to the hero and a helper may also provide assistance. At the beginning of the second move, a new villain or difficult task may be introduced into the story. During the continuation of the second move, there is a resolution of the task and the hero will undergo change through recognition, exposure, transfiguration, punishment, or marriage. During each phase of the tale, certain events will make other events more likely or more unlikely to occur. Furthermore, spheres of action may lead particular characters to perform multiple roles within a story (e.g., both a helper and a donor, or both villain and unwitting donor). Overall, Propp devised a series of 31 functions that are used together in different ways within fairy tales.

These ideas regarding narrative structure and form are only a few selected concepts from an important genre of work; there is a rich history of narratological scholarship available from which to study the structure and classification of stories. Narratologists such as Genette (1980) and Bal (1997) have authored comprehensive books looking at narratological principles from a literary perspective, and Onega & Landa (1996) have compiled essays related to the subject in a wide-reaching effort to study narrative from a variety of literary perspectives. The edited collection *What is Narratology* (Kindt & Müller, 2003), collects the results of an international symposium exploring narratology and contains essays from the leading theorists in the field. In terms of other disciplinary contributions, the French anthropologist Claude Lévi-Strauss produced groundbreaking work on identifying universal structures used in myths (Eagleton, 1996), while Campbell (1949) is a must-read volume for understanding mythological types, story structures (most notably the Hero’s Journey), and character archetypes. Vogler (1992) takes Campbell’s work and distills the ideas into a practical guide suitable for story creation and story analysis, much of which has also been applied specifically to video games in Jacobs (2007).

INTERACTIVE NARRATOLOGY

Narratives take an interesting turn when produced by interactive media. No longer are stories meticulously crafted by a devoted author, polished to an appropriate degree, and released to an audience for consumption. In interactive media environments, the user/player/reader plays dual roles as both recipient and co-author of stories. Immediately, then, we can observe that there are at least two stories that one might talk about when discussing storytelling in the genre of serious games. First, there is the game writer’s story, which is typically expressed through cut scenes and other

non-playable moments in the game. Second, there is the player's story, which is created by the player's movements, decisions, and actions in virtual space. DeMarle (2007) describes the former story as the "high-level" story and the story co-created by the player as the "immediate-level" story (pp. 77-78). Taken together, the high-level and immediate-level stories express the various narrative possibilities of a given game.

The first dilemma one generally encounters when researching interactive narrative is the rift caused by the supposed "narratology vs. ludology" debate, one that is filled with myths and misconceptions about interactive storytelling. Ludology refers to the study of play (especially in games); ludologists suggest that the narrative framework is inappropriate for the analysis of games since videogames deserve a theoretical framework all their own. Mateas (2002) has offered the term "narrativist" to refer to "a specific, anti-game, interactive narrative position" (p. 34) that suggests that narrative is in some sense privileged over gameplay and game mechanics. This idea spurred contentious debate in some circles about the fundamental nature of interactive narrative; is the medium one in which all action should be analyzed through a narrative lens, or one which is deserving of an entirely new genre of analysis based on gameplay and the unique environment afforded by interactive games? Gonzalo Frasca (2003), who is often (falsely) credited with having invented the term ludology, claims that the debate between the two camps is based on both misunderstanding and erroneous publicity; as he notes, ludologists have never claimed that storytelling is not an important part of games. Similarly, narratologists do not claim that narrative is the only important thing happening within games, but rather that narrative techniques may provide useful perspectives from which to study interactive games.

So-called ludologists argue that game studies need not be framed by narrative constructs and maintain that gameplay is the essential mecha-

nism through which games should be analyzed and studied. Narrativists, on the other hand, are interested in the potential for narrative expression that is offered through interactive gaming technologies and believe that games can be read as texts and studied using narrative conventions. The most reasonable approach in this area seems to be that considered by researchers such as Jenkins (2006) and practitioners such as Sheldon (2004) who follow a middle ground and find value in the balance of both narratological and ludological ideas. What we can take from this discussion as serious games designers is the idea that both gameplay and narrative serve essential functions within learning games. We can also observe, however, that gameplay has made many more advances than interactive narrative, which is still quite immature when compared to the innovations in gameplay mechanics of the last several years. The narratology vs. ludology debate is explored in great detail elsewhere (e.g., Mateas, 2002; Juul, 2001) so we will not spend more time with it here. It is, however, something to be aware of when considering adapting narrative conventions to serious games.

In terms of a more applied overview of interactive narrative for video games, one of the more useful resources on the topic is Chris Bateman's (2007) edited collection *Game Writing: Narrative Skills for Videogames*. Richard Dansky opens the collection by considering the purposes of game narrative: immersion, reward, and identification. He notes that identification serves two different roles, both to give players "context for their actions" that provide "justification for game actions" (p. 6) and to provide "identification in another sense as well, namely the sense of kinship and desire to become the central character" (p. 7). Sheldon (2004) provides guidance for authoring characters in video games, noting the characteristics of good game characters, the various roles available within games, and the different ways in which players can encounter characters in games. DeMarle (2007) explains the process of "gating the

story” (p. 74) in which the exponential complexity of nonlinear game stories is somewhat alleviated by reigning the player back in and herding her through narrative gates comprised of major plot points at various points within the game.

In another useful book about interactive storytelling, Crawford (2005) claims that the essential quest in interactive storytelling is to “envision a dramatic *storyworld*, not a *storyline*” (p. 56). In other words, the critical task is to consider the various types of actions a player might take as they encounter a dramatic situation within the virtual world and the various ways in which the overall story can be supported by that world. Recalling the story of Grenwin the Goblin at this chapter’s introduction, our task as an interactive designer is to consider how to sustain our fantasy-based environment throughout the duration of gameplay and learning, if indeed these two processes can be separated into distinct tasks. Stories created for games can take a variety of forms depending on game genre; for example, an abstract game like *Pac-Man* or *Tetris* has virtually no story, while complex RPGs generally have complicated and multi-layered stories that unfold over tens or even hundreds of hours of gameplay.

TOWARD A NARRATIVE TAXONOMY: CHARACTER, PLOT, AND ENVIRONMENT

Given that narratology emerged from the structuralist tradition, it seems likely that we can ask and expect an answer to the question of narrative composition for serious games. If we are to break a story down into its various elements, we will find that the stories used in serious games are composed of characters, plots, and environments, which are themselves further composed of times and places. We can decompose each of these subunits down into more primitive types. For example, we can note the differences in primary characters (protagonists), from the contemporary,

stoic antihero; to the brave, yet vulnerable fairy tale hero. We can observe the different characteristics of villains, and note how some antagonists present obstacles to the hero in the form of additional characters in the story, while other obstacles come from the environment or even from within the hero as a battle of will or a personal challenge to overcome a character flaw. A major category for the classification of game heroes or heroines is the type of growth that character undergoes over time. For example, Krawczyk and Novak (2006) suggest several binary growth patterns in which less desirable characteristics mature into more desirable characteristics over the span of the game. A few examples of these include a hateful character transforming into a lovable character, a cowardly hero becoming courageous, a dishonorable heroine finding honor, or an immature character learning about maturity. Like in fiction, Krawczyk and Novak explain that “if a character cannot change, the message should be a tragic one. If there’s absolutely no growth from any characters within a story, this is usually a sign of bad writing—and a writer who doesn’t have a handle on his or her characters” (p. 140).

Plots too are classified according to the particular dimensions of the events they string together. Based on the actions which occur during the game, for example, it is possible to use Booker’s (2005) classification of stories to differentiate between, say, an “overcoming the monster” plot and a “re-birth” plot. Furthermore, through our comparisons of game narratives to other genres such as fiction and film, we can use our prior experience with certain plot types to consider the plots most effective for certain types of player reactions. For example, if our goal is to motivate the player to continue immersing herself in the game and eventually enter a state in which narrative learning materials are indistinguishable from non-learning narrative materials, then it might make sense to adapt and use an epic, quest-like plot type like “voyage and return” or “overcoming the monster.” Similarly, if our goal is to inspire the appreciation of art

and music into a player through allowing her to travel to far off places and see art in its original historical time and place, then a tragic plot might help us serve that goal. Or, our game might be so broad as to warrant the inclusion of multiple plot types within the game. As an example, both the epic fictional quests penned by novelist J.R.R. Tolkien in his *Lord of the Rings* books and the various missions scripted by game designer Todd Howard's team in the video game *Fallout 3* offer numerous plot types woven together to challenge the hero or heroine over time.

Finally, in terms of environment, we can classify stories according to the time and place in which they occur. The difference between a science fiction novel and a contemporary thriller may be as simple as location. For example, the science fiction story might share the same essential plot as the thriller, but take place outside the normal geographical boundaries in which we live our day-to-day lives. Similarly, a historical romance and a modern love story may be similar in plot, but dissimilar in time and place. Environment is an important aspect of the game world to consider as much of what motivates players to play games is their desire to explore unknown areas and take risks traveling through mysterious areas that they would not normally traverse in the real world. Environmental changes can be influenced through everything from creative sound design, art, and texturing, to game engine modifications which allow alternate forms of exploration (e.g., swimming underwater in *Tomb Raider* or walking in zero gravity conditions to explore new areas in *Dead Space*). Practically speaking, environments are often constrained by technology. A first-person shooter (FPS) may be more likely to produce certain types of stories due to early graphic limitations of the game engines (this is why many early FPS games were in dark environments, underground, or in space), but we are now beginning to see more immersive, open-ended worlds in both FPSes and RPGs.

Thematic considerations are more difficult,

particularly because of the different conventions of game genres. For example, games in which a player builds a simulated city and reacts to emergencies may have less opportunities for creative storytelling than an RPG in which you lead a space team through explorations on Mars. But, we can at least consider some dimensions along which story might be classified in terms of thematic materials. To move towards a morphology of the serious game story, we must acknowledge that such classification is constrained by a number of internal and external factors, including, but not limited to, the overall plot, the subplots, the learning objectives, the environment, the technology and its associated capabilities, and the point of view of both exposition and gameplay. We can, however, begin to construct a preliminary narrative taxonomy keeping this disclaimer in mind.

As we have noted, in general terms, narrative can be defined as the expression of a story through a particular medium. A narrative taxonomy breaks this expression down into a series of fundamental parts. These parts can then be used as independent variables for a variety of research questions in the area of serious games. A sample (and preliminary) narrative taxonomy is shown below, adapted from the work of many of the narratologists discussed above. Below each level on the hierarchy, questions are listed to better specify the important features of each category.

Any of these categories could easily be expanded to fill additional pages with questions and potential options for their answers. For example, the inciting incident category listed under plot could easily be only one of the many narrative functional units identified by Propp (1968) and discussed earlier, and the characters could certainly be described with more nuanced facets (c.f. Dille & Platten, 2007), but the point here is not to exhaustively list every possible unit from which to assemble a serious game story. Rather, it is to suggest an overall approach to the construction of genre-specific serious games along the dimensions of plot, character, and environment. There is no

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Table 1. Narrative Game Taxonomy

Narrative Development Questions	Some Potential Options
Environment	
Where is the story taking place?	[space, underwater, Florence...]
When does the story take place?	[1435, 1912, 2077, unknown...]
Is the environment fantasy-based?	[high fantasy, mild fantasy, no fantasy...]
What are the sources of environmental conflict in this story?	[biological warfare attack, bird flu, none, volcano eruption...]
How is player action constrained by the environment?	[hot lava limits navigation to a city block, birds will attack outside Central Park...]
How realistic is the environment in depicting real world objects (e.g., graphical fidelity)?	[very realistic, cell shaded cartoons, abstract...]
How does the progression of time affect the environment?	[the environment stays the same, degrades over time...]
Character	
Who is the protagonist of the story?	[Sam or Sarah, Nichola, the unknown pilot, the scientist...]
What is the point of view of this protagonist?	[third person, first person, hybrid...]
What forces (internal or external) is the protagonist facing?	[the player is unwilling to help others, the player struggles with responsibility...]
Does the primary character have a history?	[yes, revealed through dialog with family; no...]
Is the primary character well-defined (e.g., Duke Nukem from Duke Nukem 3d), or relatively “flat” (e.g., Gordon Freeman from Half-Life)?	[the character has a weak personality to allow the player to project, the character has a strong personality...]
Who are the external or supporting characters in the story?	[shopkeeper, bowsmith, mentor, barkeep...]
Can the player control more than one character in the game?	[yes, no]
How does the progression of time affect the environment?	[the character ages over time, the character’s youth is shown through flashbacks,...]
Plot	
What type of major overarching plot does the story have?	[quest, overcoming the monster, voyage and return, rebirth, rags to riches, comedy, tragedy...]
What subplots are used?	[quest, overcoming the monster, voyage and return, rebirth, rags to riches, comedy, tragedy...]
How is the high-level plot released during gameplay? At which points in the game are segments of the high-level story unveiled?	[plot point 1: volcano erupts, plot point 2: player sees news video showing extent of damage, plot point 3: player must rescue trapped citizens, ...]
How are the plots chronologically connected?	[normal linear time, occasional flashbacks, flashforwards...]
What inciting incident motivates the player to begin her journey?	[a famous painter is murdered, the player’s father leaves home without saying goodbye, the princess is kidnapped, the volcano erupts...]

doubt that some important questions have been left out and that others may be redundant. We believe, however, that this general taxonomical approach is more useful than considering story as a primitive unit that can be attached to or removed from a given serious game in its entirety.

Also, while they are presented in separate categories, some of these questions overlap. For example, if the environment is fantasy-based, there are more than likely going to be fantastic creatures populating that environment. Similarly, if there is an “overcoming the monster” plot be-

ing used in a story, there needs to be a monster character or a metaphorical internal monster that the player is struggling to overcome. A plot that is arranged using extensive flashbacks is also going to require younger versions of characters to be present, and these characters will need to be adjusted psychologically to suit their age in order to appear more realistic. With each seemingly minor decision, there are a number of important considerations to take into account, both in terms of gameplay and production assets, and these issues help to illustrate the complexity of story design for games.

Lastly, in addition to intrinsic elements, there are also a number of extrinsic factors related to the medium (or the exposition of the story) that can be manipulated. For example, some of these items include the type of media in which the designer's story is presented (animated filmic cut scenes, live action cut scenes, textual via dialog, books, and journals left behind by characters in the game, etc.) and the point of view (first person, third person, etc.). Other issues include the degree of interactivity afforded (e.g., can the player still move their character during dialog) and the length of time elapsed between plot points.

A NARRATIVE ANALYSIS OF FALLOUT 3

To make our final point, which is that even highly regarded games are lacking in narrative coherence, we will apply our second technique for considering storytelling in serious games, which is to perform a brief narrative analysis of a video game along the three dimensions of our narrative taxonomy. Commercial games generally exhibit the most polished examples of game story environments as they are produced with multimillion dollar budgets and hundreds of employees. *Fallout 3*, which was released in late 2008, is one such example. The game was developed by the same studio that released *The Elder Scrolls IV: Oblivion*, another

award-winning game that was praised for both its open-ended exploration and massive scope. The game was produced by Todd Howard and developed by Bethesda Softworks.

Fallout 3 takes place in the year 2277 in the city and outskirts of Washington D.C. The game-world unfolds in a fictionalized U.S. capitol after the ravages of nuclear war have turned it into a wasteland. The player takes the role of a "vault-dweller" who ventures out of a sealed nuclear fallout shelter and undergoes a journey to locate his or her father in the unforgiving wastes outside the vault. The initial creation of the character is done in a highly creative way, by allowing players to take control of the character from his or her birth and then giving the players influence over a toddler, a teenager, and a young adult as they learn the basic controls and allocate skill points to create a character they will later control throughout the game.

In terms of a high-level plot, *Fallout 3* uses a general "quest" plot combined with several other canonical plot types as embodied by the side quests and even through random encounters in the game. For example, a compressed "overcoming the monster" plot is found in any random battle encounter with a feral ghoul or super mutant, while the "rags to riches" plot materializes through the player's gradual accumulation of wealth and inventory. Similar, the "rebirth" plot may be realized through the player's growth from a neutral karma to a positive or negative karma and the "voyage and return" plot emerges through the player's many questions that lead them to and from big cities in the game such as Megaton, Bigtown, or Rivet City. Comedic moments abound, such as the good-intentioned (but ultimately misinformed) authoring of a Survival Wasteland Guide by a shopkeeper named Moira and the absentminded accumulation of incorrect historical facts by an elderly and eccentric curator, but tragic moments are much more common as the player moves through ravaged fields, abandoned homes, and the burnt out husks of futuristic vehicles. Much like

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epic fiction, the narrative landscape of *Fallout 3* is both unpredictable and widely varied in terms of both plot structure and character types.

Although not designed as a “serious game,” the game possesses many characteristics of serious games, including the use of supplementary learning materials. These are then integrated into gameplay as parts of the main quests. These materials include historical facts, locations, and descriptions, although the game fictionalizes history and employs an alternate historical storyline. Despite this, one can imagine how *Fallout 3* could be repackaged as a serious game. There is ample opportunity for embedding additional legitimate learning materials about U.S. national history into the game. Many of these opportunities are already used in various quests and encounters in post-apocalyptic DC, which require the player to move through locations such as the Museum of History, the Capitol Building, the Museum of Technology, the White House, and the National Archives. While some locations have been renamed and relocated for inclusion in the game, the locations are ripe for embedding information about American history, political science, and even the history and culture of technology. Several of the game’s missions direct the player through journeys to retrieve famous historical documents such as the Declaration of Independence and the Bill of Rights, though the catalyst for these missions is an unfortunately misinformed amateur historian by the name of Abraham Washington, curator of the Capitol Preservation Society in Rivet City.

By most accounts, *Fallout 3* is a triumph of a game. Garnering critical success by the mainstream gaming press (Linn, 2008; Tuttle, 2008) as well as high aggregate review rankings (93/100) by MetaCritic.com, the game captured the imaginations of thousands of players and immersed them within the radioactive dystopia of the Capital Wasteland. Much of this immersion was due to the successful narrative transportation enabled by the game’s designers (cf. Green, 2004). What is particularly interesting about this

fact, though, is that the environment presented in this post-apocalyptic version of Washington D.C. is rather dull. There are not a particularly large number of enemy types to battle and the scenery is mostly dreary: brown, grey, and without color. However, the capacity of the *Fallout 3* environment to immerse the player is well-documented, with players posting to discussion boards after having played the game for hundreds of hours. The game’s immersive capacity is due in part to the unique narrative mechanics engaged by the game, but even *Fallout 3*’s stories are problematic for a variety of reasons. We can further deconstruct the successes and failures of *Fallout 3*’s storytelling by considering the narrative functions of the game as they relate to one another at different points during gameplay rather than merely analyzing the simple characteristics of its plots as they exist in isolation. We can also consider the game’s narrative problems in terms of environmental, plot-driven, and character-driven storytelling.

To begin, we can consider what works, narratively and holistically speaking, in *Fallout 3*. Perhaps the greatest narrative achievement of the game is its integration of nonlinear storytelling with hybrid game mechanics. While not strictly an RPG and not strictly an FPS, *Fallout 3* combines elements of both genres in order to make innovations in several key areas of the game, one being the cinematic sequences afforded by the V.A.T.S. (the vault assisted targeting system) device used in the game. While it would seem that such a mechanic is more related to gameplay than story, the way in which the device is presented to the player, as a gift given early on to the vault dweller during her initial training, makes for a seamless integration of gameplay and story. There is a narrative reason for the device (to secure the gift as a token of maturity from a donor character) as well as a ludic reason (to learn an important game mechanic early on in the game).

A second impressive aspect of *Fallout 3*’s narrative model is the way in which the world reacts and reshapes itself based on prior decisions

of the player. Perhaps unlike any game before it incorporating FPS mechanics, *Fallout 3* offers a nonlinear experience that flexes and adapts in terms of dialog and available quests. If the player chooses to kill a character in the game, future missions that involve that character are no longer available. Sell an important object and you may eliminate future plots which require that object to function. If you are too good or too evil in the game, characters will choose to join you in your campaigns, provide aid, shun you, or attack you. These outcomes depend on your prior actions and decisions. This is quite an accomplishment given the 14 primary quests and more than 70 side quests available in the game.

Despite its critical success and its highly regarded story, *Fallout 3* suffered its share of narrative failures upon launch, and we can learn by considering some of its problems. The first major problem (a fundamental problem of *plot*) presented itself through technical bugs in the path-finding algorithms. It was documented on several forums (and personally experienced by an author of this chapter during gameplay) that important non-playable characters (NPCs) could fall to their early deaths due to incorrect pathfinding in the city of Megaton. Built using scrap metal and old parts, the city presented many locations from which it was easy to fall and cripple a limb or even die. This problem was fixed with an update patch provided several months after the game's launch, but the presence of this glitch caused for many holes to emerge in the various plots of *Fallout 3*. As one simple example, the player is approached by a water treatment repair character, Walter, early in the game. Walter informs the player that she can bring him additional pieces of scrap metal, scattered throughout the Wasteland, in return for a certain number of bottle caps (used as currency in the game). When Walter falls off the ledge to an early death, this particular narrative branch is closed off to the player through no action of her own, and she has no way of knowing whether Walter will ultimately put an end to his offer of scraps

for caps or simply continue on indefinitely as long as the player can locate more metal. When Walter suddenly disappeared for no apparent reason early in the game, this was a narrative inconsistency that reduced immersion and contributed to player frustration. Particular plots were no longer able to be experienced by the player.

A second problem, concerning narrative *environment*, is found in the fact that environmental boundaries are not well-integrated into the overall narrative. For example, when reaching the limits of navigable space (to be fair, the world is quite large), a message appears to inform the player that she can no longer proceed in that direction and to please turn back. This could have been addressed through the inclusion of environmental obstacles surrounding the perimeter of walkable wasteland. Another environmental problem is found in Rivet City, where there is a gap in a broken railing on the flight deck. The gap is clearly wide enough for the player to fit through and drop down onto the flight deck, and yet they are unable to. In this case, a gameplay problem contributes in part to a narrative problem, as the environment below looks enticing to explore and yet the player cannot physically go there (at least via that route). When gaming, players expect reasonable actions to succeed (Rouse III, 2005) and such problems with the gameplay also contribute to environmental narrative problems, which can further lead to implausible plots or unlikely developments in the story.

The last category of narrative problems can be found in NPC behaviors. These are problems with *character*. First, NPCs are often unaware of their environment. For example, when questioning a character about the location of another character in Rivet City, an NPC might respond by directing the player to "upstairs on the upper deck" rather than the more appropriate "directly behind where I am standing." This lack of basic environmental awareness reveals limitations in NPC artificial intelligence which undermines the quality of the characters and degrades the overall experience.

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Further, NPCs sometimes respond inappropriately to environmental cues. For instance, when standing in the player character's home, a fellow party member might proclaim to exercise caution because danger is near, even when it clearly is not. These types of canned responses which do not adapt to the environment are similarly troublesome for recognizing NPCs as realistic characters in the immediate-level stories of the game. Finally, NPCs do not respond appropriately to accompanying party members (characters in the game who have joined with the player as allies). For example, the paramilitary organization known as the *Brotherhood of Steel* professes a supreme desire to rid the Capital Wasteland of all super mutants, and yet when the player arrives with an intelligent super mutant in tow, none of them have anything to say about it and they continue to address the player as though nothing out of the ordinary was occurring. You would expect at least a curious questioning upon arriving with such a companion.

CONCLUSION: IMPLICATIONS FOR THE FIELD

Despite significant improvements in non-linear storytelling in video games, there remains much to be studied and improved upon in regards to the effective use of narrative in this medium. As we have shown with our discussion of *Fallout 3*, even award winning games leave a lot to be desired in terms of presenting coherent stories to an audience. While the willing suspension of disbelief carries audiences along without much complaint, an improved narrative framework would improve the overall quality of serious and non-serious games alike. Rather than there being one particular way of measuring narrative coherence or operationalizing this concept, we must begin to think about serious games storytelling at a more precise level of granularity. How much interactivity is ideal for a particular genre of game

that uses a particular type of plot structure? What constitutes an effective use of plot in a particular genre versus a non-effective plot? How can we create more believable NPCs that players can relate to while still leaving them to feel empowered to control their own experiences in the gameworld? Are fantasy-based environments more suitable than non-fantasy-based environments for teaching certain subjects using videogames? Does Propp's morphological study of fairytales translate well to videogame stories, or should we begin analyzing existing game narratives for a new database of dramatic functions suitable for interactive experiences? These are only a few of the numerous questions prompted by a more nuanced discussion of storytelling in serious games.

At a more practical level, we believe that more attention needs to be paid to the role of story in video game environments. For example, a game developer rarely releases a game in which major graphics problems are sustained throughout the entire game, or in which important input buttons on the keyboard or controller cease to work entirely. These things do happen from time to time, but they are relatively rare for highly regarded games. Narrative problems, such as those mentioned previously, are unfortunately all too common, and seem to be taken for granted. In other words, it is okay to have an incomplete or incongruent story because the player is willing to accept it. That may be true to some extent, but if we are to subscribe to the notion of using serious games to better immerse, transport, motivate, and educate the player within a certain educational domain, then we must also consider the potential impact of including a story with incomplete or incongruent information within a specific game environment. To truly design and produce effective serious games for learning, we must also tame the beast that is serious storytelling. While high-level stories are easier to plan and account for, the focus needs to move to considering ways to improve and assess the effectiveness of immediate-level storytelling in terms of plot, character, and environment.

As we suggested several times in this chapter, we must also move away from the habit of considering stories as homogenous entities. Stories are not interchangeable atomic units which can be inserted or removed at will from serious games. Rather, they are sophisticated entities which can be decomposed and reconfigured in a variety of different ways for different dramatic and pedagogical effects in different types of games. It is our hope that this preliminary discussion of a narrative taxonomy for serious games and our conceptualization of the serious game story along both applied and theoretical dimensions will begin a sustained discussion on the subject and lead to additional research on this very important topic. Interactive storytelling, like artificial intelligence, remains a “holy grail” research problem and although some progress has been made in the last decade, the tropes and techniques of this process are far from mature.

So, based on what we have covered in this chapter, how might we improve the story of Grenwin the Goblin we posed in our introduction? The first thing we might do is consider the story in terms of plot, character, and environment. To improve the plot, we need knowledge of the events occurring before and after the player’s entry into the local tavern. Based on prior or future events, it might make more sense to move the learning material into a different part of the game, perhaps into a strategic planning session where the player must help townsfolk calculate the right trajectories for catapults to help hold off an invading goblin horde. This would be less intrusive than the current implementation where the player must apply the Pythagorean Theorem as she is working with other complex control decisions such as moving her avatar out of reach of the rusty axe and working with the controls to manage her bow and arrows. In terms of character, it could be interesting to fictionalize and introduce a character named Pythagoras who is a mentor to the heroine and helps her hone her skills using geometry prior to meeting Grenwin in

the tavern. Finally, environmental solutions could be explored, such as by envisioning the game in a more contemporary urban landscape and allowing the player to act as a city architect or planner in which knowledge of geometry would be more directly relevant to the type of game. In any case, a variety of approaches could be used to improve the game, but these changes should be carefully considered within the overall context of keeping the player motivated to play and addressing the learning objectives set out by the designer.

In this chapter, we examined the case of serious storytelling along two dimensions: theoretical and practical. Through our theoretical coverage of traditional narratology, we introduced fundamental ideas about how stories are composed, named, arranged, and classified. We next suggested practical ways in which these ideas can be applied to stories used in serious games. By applying narratological principles, we devised a preliminary framework for thinking about storytelling along the three dimensions of plot, character, and environment. We concluded by critically analyzing a contemporary video game in terms of these three dimensions. The rich interplay between these perspectives; and the ability of humankind to use narrative as a technology for communication, entertainment, and education; suggests that this complex form still has much to offer to both researchers and developers of serious games. As we move closer to building truly effective learning games that both motivate players to continue learning and generate transferrable skills and knowledge from the virtual to the real, we would do well to keep in mind the awesome power of interactive storytelling as a means for improving narrative transportation, motivation, and learning. We must also, however, be cautious and realistic. We should acknowledge the work that will be necessary in building our serious storytelling abilities up to the same levels as we currently see in cutting-edge gameplay mechanics such as those used in *Fallout 3*. With a careful attention to the dramatic, ludic, and psychological factors of interactive narrative,

we can develop innovative fiction writing and programming techniques that will continue to push the envelope in both interactive entertainment and serious game design.

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