

CARAC TERES

Estudios culturales y críticos de la esfera digital

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Caracteres. Estudios culturales y críticos de la esfera digital

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When Video Games Tell Stories: A Model of Video Game Narrative Architectures

Cuando los videojuegos cuentan historias: un modelo de las arquitecturas narrativas del videojuego

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ABSTRACT: In the present study a model is proposed offering a comprehensive categorization of video game narrative structures intended as the methods and techniques used by game designers and allowed by the medium to deliver the story content throughout the gameplay in collaboration with the players. A case is first made for the presence of narrative in video games and its growth of importance as a central component in game design. An in-depth analysis ensues focusing on how games tell stories, guided by the criteria of linearity/nonlinearity, interactivity and randomness. Light is shed upon the fundamental architectures through which stories are told as well as the essential boundaries posed by the close link between narrative and game AI.

RESUMEN: En este estudio se propone un modelo que ofrece una categorización comprehensiva de las estructuras narrativas del videojuego concebidas como los métodos y técnicas que emplean los diseñadores y que permiten al medio ofrecer el contenido de su historia a través de la jugabilidad en colaboración con los jugadores. Se presta especial atención a la presencia de la narrativa en los videojuegos y a su importancia creciente como componente central del diseño del juego. Un análisis profundo se centra en cómo los juegos cuentan historias en función de los criterios de literalidad y no linealidad, interactividad y aleatoriedad. Se arroja luz sobre las arquitecturas fundamentales a través de las cuales las historias son contadas así como también los límites impuestos por la estrecha relación entre narrativa e inteligencia artificial del videojuego.

KEYWORDS: story in videogames, media, narrative, Artificial Intelligence, interactivity

PALABRAS CLAVE: historia en videojuegos, medios, narrativa, inteligencia artificial, interactividad

1. Introduction

During the last two decades, the medium of the video game has generated an increasing interest in the academic community, drawing the attention of scholars from a variety of disciplines due to its increase in popularity and its impact on culture and society. One aspect which is being regularly investigated is represented by the vision of the video game as a storytelling platform. However, while the existing literature has focused primarily on the story content, attempts to investigate the way in which games tell stories have not only been few and far between, but have often failed to provide a clear and systematic picture.

The present article aims at providing a model offering a comprehensive categorization of video game narrative structures. First, the presence and growing importance of narrative in video games are demonstrated. This is developed across two levels. By applying the traditional tools and notions of narratology to video games, I show how not only the traditional story constituents emerge across a wide range of game titles, but also how the fundamental narrative components (narrator, narration, narratee) are maintained and adapted to the medium's technology. Secondly, I illustrate the tendency and intention among game designers, as well as literature authors, to exploit the potential of the medium as a promising and innovating storytelling platform. This is described as being both in line and a consequence of the increasing importance of the story component in game design and its affirmation as a core feature in the development process.

Next, an in-depth analysis is carried out focusing on how games tell stories. Resulting from an extensive investigation of game titles embracing all genres since the earliest commercial titles in 1969, the analysis attempts to shed light upon the fundamental architectures through which stories in games are told as well as the essential boundaries posed by the very nature of the medium. More specifically, narrative structures are here intended as the methods and techniques used by game designers and allowed by the medium to deliver the story content throughout the gameplay in collaboration with the players.

2. Narrative Elements Emerge in Video Games

Before understanding how narrative emerges in video games and the importance it gains in the design process, it is important to direct some of the attention to a gap between the academic research approaching games in terms of their narratives and game designers' increased interest in harnessing the storytelling potential of the platform. This can be observed primarily in the long lasting methodological divide involving the narrativist and ludological approaches to the study of video games which reached its peak during the early 2000s. While at the ludological end of the spectrum the very notion of narrative in games was being questioned, in the narrativist current efforts were made to envision games as being a part of a wider transmedia context in which stories are told, re-told and expanded in a media multi-platform environment.

Undertaking an academic study on video games as storytelling platforms depends on how flexible or narrow a narrative definition one is willing to embrace. The present study embraces both currents, accepting the fact that video game design can function in the absence of a narrative structure but also emphasizing particularly the increased prominence of storylines in the design process and the consequent necessity to explore what methods are allowed by the medium to tell stories.

Traditional objects of inquiry of narratology such as plot structures and the entities of narrator and narratee are clearly identifiable in video games. Barry (2002) describes how an influential branch of literary theory studies known as Structuralism, later transitioned into Post-Structuralism, displayed an interest towards prose narratives “as a complex of recurrent patterns or motifs” (49), trying to isolate a finite number of units of meaning, or “lexies”, which would then give rise to “all possible actual narratives” (50). Indeed, most story-driven titles follow the circular model of narrative elaborated by Todorov:

An “ideal” narrative begins with a stable situation which is disturbed by some power or force. There results a state of disequilibrium; by the action of a force directed in the opposite direction, the equilibrium is re-established. (1977: 111)

The study of the constituents of a told story goes farther back, with Russian Formalist Vladimir Propp and his study, in *Morphology of the Folk Tale* (1928), of the 31 fundamental narrative functions of folk tales, and further back to Aristotle’s definitions of Hamartia (fault), Anagnorisis (realization) and Peripeteia (reversal). In one of the earliest titles featuring a complete, albeit basic plot, like *Donkey Kong* (1981), it is possible to see how fundamental plot elements emerge. Donkey Kong kidnaps the princess, disrupting the order and requiring the hero, Jumpman, to overcome challenges to eventually rescue the princess and restore the initial order. Examples of plots following this circular pattern abound in game design. In the *Resident Evil* (Capcom, 1998-2013) series, a state of peace is typically disrupted by a virus outbreak turning people into zombies and requiring the protagonist to fight in order to restore the initial state. The disturbance of an orderly state is indeed fundamental to all games in giving players end and purpose to the objectives and challenges posed by the gameplay.

Not only, as Newman indicates, “the premise of many video games is reminiscent of Todorov’s basic narrative structure” (2004: 91) but a closer comparison between Propp’s seven dramatis personae (1928) and the typical characters present in story-driven video games will reveal how

in the latter, especially in the RPG genre, these emerge regularly and their role has become conventional also in terms of the gameplay function they bear. Further notions regarding the function of narrative, the identity of narrator and narratee, and the temporality of the narrations also apply to games. According to Genette (1980), in no case is the narrator completely absent and every narrative implies a narrator and functions as the recounting of a series of events through different temporal dimensions. In games, events are narrated as they happen, and seeing games as narrative is possible by bearing in mind the following correspondences:

- Narrator – Game designers

The game designer weaves the story and the order of its events into the fabric of the game world.

- Narratee – Players/Spectators

The intended audience of every video game is principally the player.

- Narration – Collaborative act between game designers and players

The game designer organizes the story content into the interactivity of the game. The unfolding of the events is triggered by the player's actions and progression.

- Temporality – Simultaneous narration

The temporality of in-game narration translates into a real-time unfolding of the events. The story is told the very moment it occurs. This is fundamental for player's interactivity and agency within the game world.

2.1. Increasing Importance of Story in the Games Development Process

Observing the growth and expansion of stories in video games reveals a shared interest among designers in seeing the medium as an innovative platform for telling stories. Presenting cohesive stories represents a strong drive in game design, observable since the mid-1990s.

During a recent interview, Dan Pinchbeck, author of the narrative-driven game *Dear Esther*, expresses his excitement on the potential games have gained regarding storytelling. “One of the really wonderful things about games in the last few years’ he says, ‘has been the huge advances in depth and detail in terms of storytelling, particularly using games to spin these extraordinary worlds” (2012: web). *Dear Esther* casts players on a seemingly uninhabited island on the Hebrides. There are no objectives to complete, no enemies to defeat, no puzzles to solve. The emphasis is placed on the free exploration of the lonely environments during which an epistolary narrative is delivered through fragmented texts narrated by an unknown voice. Like Pinchbeck, many game designers nowadays approach the medium as a creative storytelling platform with the objective of delivering engaging story experiences. In his developer’s diary (2013) of his upcoming project *Rain* (Acquire SCE Japan Studio, 2013), Yuki Ikeda emphasizes how the nature of the game is being built from the narrative premise of emotional contrasts of despair and curiosity faced by a child who gets lost in a desolate, rainy urban environment. Similarly Quantic Dream’s David Cage recounts how ‘we wanted a better blend of storytelling and interactivity’ (2012: web) as the main appeal for his recent title *Heavy Rain* (2010), emphasizing the story-driven gameplay experience offered in the previous title *Fahrenheit* (2005). Players controlled different characters of the same story at different times, with a gameplay centered primarily on interactive dialogues and a multi-directional storyline leading to multiple endings.

While heavily story-centered titles like *Dear Esther* or *Heavy Rain* tend to be considered as alternative game experiences, with the majority of game titles retaining the traditional action and puzzle-solving elements, the story element has become a core component in the design process in general, often affecting the way the game world is built and the type of gameplay actions and interactive options which will be available to the player. Media scholar Henry Jenkins comments on how “while not all games tell stories, many do have narrative aspirations” (2004: 119). Certainly game designers often embrace the possibility of exploiting the storytelling potential harnessing the computing power at their disposal, and “the elective affinity...between computer games and narrative frequently surfaces in the talk of designers” (Ryan, 2006: 183). While the interest in narrative profoundly increased with the advent of real-time 3D graphics, it is safe to say that the storytelling component has been part of game design since the early days of the medium, though often kept to a minimum due to the hardware constraints of the technology of the time. Even games whose premise is not based on recounting narrative events still present the element of *mimesis* (role-play) intrinsic to the

nature of games. As Ryan notes, a “unique achievement of computer games [...] is to have integrated play within a narrative and fictional framework” (2006: 182). In every video game, the player becomes what the player controls, assuming a role detached from reality and engaging in a leisure activity by performing actions in a fictional game world.

The missing in-game story narrations and information regarding the identity of characters and/or fictional settings of early titles were nonetheless supplied externally through instructions booklets promoting players’ immersion in the game. Salen and Zimmerman (2004: 371) use the example of ATARI’s *Super Breakout* (1978) to indicate the early tendency from game designers to create “backstories [to] position a player in the context of a larger story”. Thus, the act of destroying coloured bricks becomes the encounter of a “one-man space shuttle” with “one gigantic force field of some kind”. The tendency of embellishing the game experience with story elements and using these to appeal to players continued to represent a stable aspect of game marketing, first in the form of story information in booklets and game boxes to offer a fictional setting which could not otherwise be distinguished by playing the game due to graphical limitations. Ryan notes how “even in the 1980s, when computing power only allowed rudimentary graphics, developers promoted their products by promising a narrative experience that rivaled [...] action movies” (2006: 182). Over the last thirty-five years this has become a convention with the function of introducing players to story settings that now find their full in-game realization.

To take an example, the increased importance of the story is also reflected by the adoption of themes and motifs by genres which traditionally minimized story elements. The puzzle game *Catherine* (ATLUS, 2012), for example, builds a multi-branched story architecture around what is essentially a block-moving, logic puzzle-based gameplay. The game story, delivered through cinematic interludes and real-time interactive dialogues, is emphasized over the core gameplay since the beginning both through a long introductive sequence and on the box art:

Vincent Brooks has been struggling in his relationship with his girlfriend of five years, Katherine. He’s fine with keeping things the way they are, but she’s set her sights higher than that, and the word “marriage” has come up. (ATLUS, 2012: web)

The expressive potential of games to bring to the screen fictional worlds of vast dimensions, populate them with large arrays of characters, and make them navigable has also attracted the attention of literature authors interested in harnessing the interactivity and dynamic

expressiveness of the medium. Terry Pratchett's *Discworld Noir* (GT Interactive, 1999), Clive Barker's *Undying* (DreamWorks Interactive, 2001) and *Jericho* (Mercury Steam, 2007), Sapkowski's *The Witcher* (CD Projekt, 2007) and Glukhovsky's *Metro 2033* (4A Games, 2010) are notable examples of authors directly involved in the expansions of their world on the game medium.

3. Video Game Narrative Structures: Premises and Criteria

What kinds of narrative architectures are currently found within the medium? Here I define four narrative structures, namely Pre-established, Discovery, Sandbox and Computer-generated. They appear individually or sometimes combined in all games bearing any type of story content and delineate the technical boundaries of what is currently allowed by the medium. To this regard, the basic premise which enabled the present study to identify the narrative boundaries of the medium and outline two fundamental properties common to the four structures is represented by *the close dependency of narrative on game AI*. More specifically, the story content is primarily delivered through the game's synthetic agents and the world elements, both of which respond to AI algorithms controlling the interactions with the player. These elements are programmed to react to players' input through a pre-determined set of responses including the delivery of story information. These can occur through explicit oral and written narrations (dialogues, recorded logs, written text), as will be seen in the first two categories, as well as simply through events which are consequences of the players' interaction with the game world (categories 3 and 4).

Furthermore, in analyzing how the stories are told, a number of criteria were used to identify the four narrative architectures and highlight the differences among them. The first criterion is represented by the degree of linearity/nonlinearity through which the story unfolds. This determines the presence of single or multiple story branches and the degree of freedom players have in the gameplay. The second criterion is the level of in-game interactivity when it takes priority over the main storyline by generating a varied number of events which become the main narrative source. Finally, the last criterion is the randomness associated with game titles in which the events generated autonomously through the combination of large number of variables constitute the primary narrative source.

3.1. *Pre-established narrative structure*

The Pre-established type of narrative can be considered as the principal and most common storytelling architecture. In its purest form, this type of structure offers designers a highly controlled story delivery environment governing the main plot of the game. The term Pre-established refers to how bits of the story are revealed. As players “hit” certain checkpoints during the game, the next story sequence belonging to the primary plot is triggered and they will follow an unchanging path from start to end. First, a high degree of linearity is characterized by a strict order through which the story unfolds as well as the absence of side-stories or additional background story information for players to discover, with a consequent low degree of freedom. In addition, interactivity and randomness have no impact upon the story. The possible interactions are often limited to combat and action related gameplay and breakable objects, while scripted sequences are predominant. This renders the gameplay experience as a succession of fixed set-pieces which allow no randomness and lead always to the same next event.

Discussed by Juul as ‘narrative of progression’ (2005: 72-73), the story plot following this structure develops in a fixed, linear fashion that normally starts with an introductory sequence, in which the main fictional settings are presented along with the events that will disrupt the initial equilibrium. Their main function is to establish the identity of the game world and the role players will assume by introducing the protagonist or entity players will control, and provide narrative meaningfulness for the actions and interactions that will follow. Levels or stages are presented as self-contained units, often representing different locales and thematic blocks. Jumping to levels ahead is normally not possible. Linear structures are most typically employed in action-oriented series, especially highly cinematic first person shooters such as the series of *Call of Duty* (Infinity Ward/Treyarch, 2003-2013), *Battlefield* (DICE, 2002-2013) and *Killzone* (Guerrilla Games, 2004-2013), all characterized by intense gameplay sequences reminiscent of scripted cinematic set pieces, that will simply repeat if re-played or if restarted upon failing the missions.

Once a level is completed a chunk of the story information is released by means of a cutscene until the final ending. Inter-level cutscenes or sequences act as spatial and temporal separators. While these normally establish the setting for the upcoming level, they can also recap on past

events. For example, the inter-chapter interludes between levels in *Resident Evil: Revelations* (Capcom, 2012), appearing in a TV series format, provide a synopsis of the previous events until the present time. On the one hand, game designers can add more variety by dissecting the plot into several story branches and providing different endings according to key decisions players will take during the gameplay. Story-branching and multiple endings, however, do not affect the nature of the pre-established architecture, and simply position players onto parallel story railway paths. On the other hand, story elements as well as character development can take the form of in-game dialogues and texts, sometimes replacing the more common cutscene. In *Remember Me* (Dontnod, 2013) the story is released primarily through radio dialogues between Nilin, the main protagonist, and an unseen figure known as Edge. The order and pace of these intermittent narrative sequences, while minimizing what Newman defines as 'the segmentation of videogames into interactive and non-interactive sequences' (2004: 72), still occur according to the designer's intentions, and are beyond the player's control.

In short, Pre-established structures, which already guided the basic plots of early games like *Donkey Kong* or *Super Mario Bros.* (Nintendo, 1985), favour linear narratives which, while not excluding the existence of rich and complex plots, do not allow players to take a more direct control over the story.

3.2. *Discovery narratives*

A higher degree of freedom in terms of pace and delivery of the story is true of titles that implement a Discovery narrative structure relying on players' free exploration of the game world and subsequent discovery of story information. Unlike the Pre-established structure, here we are presented with a higher degree of nonlinearity combined with the frequent presence of side-stories and/or multiple story branches. While an overarching pre-established storyline is still present, more space is given to the exploration of the environments and optional retrieval of additional story information. In this case, the order with which the side-story events are narrated is not fixed, but can often vary according to how players decide to explore the game world and/or interact with other NPCs (Non-playing Characters).

More interaction with the characters encountered in the game can lead to more story elements being revealed, which Ryan refers to as 'microstories told by nonplaying characters' (2006: 201).

RPGs like *Dragon Age: Origins* (BioWare, 2009) or *The Elder Scrolls V: Skyrim* (BGS, 2011), heavily invest, for example, in large number of side-stories that can be revealed only after players have met certain conditions, such as speaking to specific NPCs or exploring certain locations on the map. While the pre-established, main story arc is still present, the designers intentionally withdraw large amounts of story information from the main narration in order to weave them into the game world and among its inhabitants. This highlights another difference with the first type of narrative in the form of higher levels of interactivity. NPCs, for example, provide more interactive dialogue options, while more types of interactions with the environment are offered to players in order to discover additional story texts and documents. Both Ryan (2006) and Jenkins (2004) refer to this structure as embedded narrative, which is “relatively unstructured and controlled by the player as they explore the game space and unlock its secrets” (Jenkins, 2004: 126).

The storytelling becomes, in this case, an act of narrative reconstruction and impacts on the overall understanding of the main plot. This can in fact be more or less complete according to how deeply players choose to explore the game world. A fertile ground for Discovery narratives to be exploited is represented by the “open” maps. Games featuring open maps are characterized by players being able to access large portions of the map without spatial or temporal restrictions, and explore them with no pre-established order. Open worlds offer a playground for paideia-oriented gameplay, giving players the possibility of stepping out of the main story plot and structured missions.

To take an example, the latest *Tomb Raider* (Crystal Dynamics, 2012) adopts the open world concept by giving players access to most areas of the Yamatai Island in which the story takes place. The absence of level transitions permits players to freely wander around the island. It is possible to retrieve documents in the form of journals from previous inhabitants and lost artifacts which provide information regarding the curse engulfing the island, the identity of the people who were there before, and the meaning of the rituals of the secret Solarii cult of the Sun Queen. The main story plot unfolds through a number of set cutscenes and dialogues triggered after completing several missions whose execution can be postponed indefinitely.

Similarly, the world in *Assassin's Creed* (Ubisoft, 2007-2014) is purposefully designed so that many secondary story elements emerge incidentally upon exploration. For example, players travel across the port city of Jaffa, finding some sections of the place in ruins. To those following

the pre-established storyline and quickly advancing through the memory sequences, this may appear as a part left blank because not relevant to the main story. However, this information gap is filled if, during the first half of the game, players detach from the main story and freely roam the environments where they might chance upon a square in Damascus where an activist is speaking to a small crowd. By lingering, the following will be heard:

I stand before you to deliver a warning! Should Richard take Jaffa, there will be no stopping him! He will march on Jerusalem next. We must end this before it has a chance to begin. (Ubisoft, 2007: n.p.)

Returning to Jaffa, the ruins are explained, as are Richard's motives for heading towards Jerusalem.

There are, however, variations in terms of free map exploration. While some games like *Skyrim* render the entire map available to explore since the start, other titles limit the map accessibility, confining players' exploration only to certain portions of the map or stages, as in *Final Fantasy XIII* (Square Enix, 2009).

3.3. *Sandbox narrative*

The main pre-established story plot becomes even thinner and increasingly secondary with Sandbox narratives. The crucial element differentiating this category from the previous ones and defining the narrative in Sandbox games is represented by the high levels of interactivity with the game world and the entities populating it. More space is also given to the element of randomness, taking the form of autonomous random events occurring without the players' intervention.

While Discovery narrative games like *Tomb Raider* or *Assassin's Creed* still keep certain areas inaccessible, free roaming sandbox games present fewer limitations. As observed in *Red Dead Redemption* (Rockstar, 2010), the principal idea is to motivate players to spend a long time learning about the fictional world and its characters, and doing this in several ways all marked by highly interactive environments. Upon entering one of the many saloons, for example, players can verbally interact with people while ordering a drink, sitting at a poker table, intervening in a quarrel or simply renting a room. Other locales offer different types of

interactions, and the overall effect this system has in terms of narrative is a series of events and activities at the end of each gaming session which will differ from player to player.

This gives rise to a more personalized and almost always nonlinear series of events emerging as the result of players' interaction with the game world. This type of narrative is also identified by Ryan, who speaks of it as one "that players write through their actions...within the range of possibilities offered by the built-in script" (2006: 201). This category presents a great number of interactional possibilities distributed across the game world for the players to engage with. "Give them a sandbox, and they will build castles" is, according to Breslin (2009: web), a recurrent motto among sandbox game developers, and translates in providing players with a vast open-ended world free from a pre-determined/linear story path and filled with elements to interact with. Sandbox games like *Far Cry 3* (Ubisoft Montreal, 2012) or *Red Dead Redemption* (2010), are designed to maximize the paidia type of play and provide an interactive environment where players can exercise creativity and craft individual stories which maintain a sense of cohesiveness within the greater narrative framework. During the first tutorial sections of these games, instructions are offered about the interactive options players have while exploring the game world as a "necessary framework guides the presentation of the sandbox elements as the world develops and unfolds" (Breslin, 2009: web).

In *Red Dead Redemption*, players' individual narratives are also promoted by a game world designed in such a way as to appear to have its own ecosystem with a number of built-in randomized systems. A randomized weather system is developed so as to have a direct impact upon the morphology of the terrain, vegetation, animals as well as inhabitants of the various settlements. NPCs' behaviour is designed to respond logically to this type of environment. They will take shelter under a tree in the haze of a sunny day, or run seeking for shelter during heavy rainfall. Likewise, if NPCs are travelling during the night, chances are that they will set up a small camp and light a fire for warmth and to keep wild animals at bay. During wet and humid conditions, the terrain will become slippery and muddy, making it difficult for the protagonist and his horse to travel across steep ridges. Events involving NPCs may also randomly occur throughout the game world, with players being able to intervene if they are in the immediate vicinity. They may defend solitary carriages facing robbery, or settle riots and shootouts after a game a poker. Finally, players can also encounter various behavioural responses from NPCs according to the reputation built through their actions. For example, reckless killing sprees or cheating at poker will create avoidance and players may no longer be given access to certain

areas. On the other hand, providing help and support will result in NPCs trusting the player with certain requests and missions. This, along with the randomness and non-scripted nature as seen in *Red Dead Redemption*, contribute to promoting diversity of narrative events between gameplay sessions and between players. Players' feeling of creating their own story is, interestingly, reflected in their recording and editing of their gaming sessions for upload on popular video channels such as YouTube as mini stories complete with title and plot.

Notably, the high level of overlapping can be observable especially for the first three categories. The presence of a Pre-established narrative for the main storyline can feature also in titles bearing Discovery and Sandbox narratives. It is a conventional element which, whether minimized or maximized, helps bind together the experience of starting a game and completing it.

3.4. Computer-generated narrative

This type can be observed primarily in games belonging to the simulation genre, and can be distinguished from the other narrative structures by the absence of a main pre-established story plot and the maximization of randomness and autonomously generated events. Simulation games provide players with virtual systems that simulate real-life settings, and "afford considerable control and influence over the game world" (Newman, 2004: 116). The generated narrative is represented by the combination of events resulting from players' choice of initial rules and conditions through a large number of variables affecting the development of the simulated system.

Will Wright's famous life simulation, *The Sims* (Maxis, 2000-2013), attempts to simulate daily activities of the life of a human family and requires players to specify values governing the personality and characteristics of their Sims. Tools are given to customize their appearance and create from scratch their living environments. After creating the initial environment and setting the internal variables for each Sim, players' Sim family will have a set of physical, mental and social desires to satisfy, and these can cover social interactions, family building and finding jobs, buying a larger house or simply spending time sleeping or watching TV. Sims will take action according to which need has to be satisfied and this will also depend upon their personality. The personality comes from the combination of traits and wishes, and can therefore have a large

number of variations. The AI governs the Sims' decisions based on long-term wishes and random short-term objectives that are included in the satisfaction of mental or physical needs. The game world also provides constant information to the NPCs through the objects around them. Each object feeds information on how it will affect the Sims' mood and how it is to be used. This allows Sims to interact with their environment in varied ways without the player's intervention. For example, a Sim who needs to satisfy his or her fun need can choose between a pinball machine and a book. Since the personality will determine which object is used, a serious Sim will likely read a book while a playful one will opt for the pinball machine. Players can either simply observe how these behave and live, or intervene to influence their actions, but do not have direct control over the Sims. These large amounts of interconnected variables lead to the autonomous generation of various logically linked events that constitute self-contained narratives. Ryan points to "retellability [as] a function of the particular nature of the generated events" (2006: 193). Not surprisingly, the variety of events occurring in *The Sims* often motivates players to record and upload their custom stories on popular internet channels, reflecting Wright's objective to provide users with "a storytelling platform" (2012: web).

While *The Sims* undoubtedly lends itself well to the generation of logically connected events, all game simulations offering players control over the conditions and variables of the game world rather than controlling a particular agent bear the same narrative potential. While both Jenkins (2004) and Ryan (2006: 181-203), referring to Sales and Zimmerman's (2004: 167) misleading explanation of emergence in video games, approach this type of narrative as "emergent", hinting to its supposedly non-programmed, unpredictable nature, this term is avoided in this context as emergent narrative would indicate a narrative that cannot be fully predicted, regardless of how many variables are known, and is non-deterministic. Computer-generated narrative, instead, is specific to what we have observed in *The Sims*, in the form of diverse events generated through a combination of variables allowed by the game AI. The NPCs behaviour can be predicted with the knowledge of a quantity of values. A Sim will incur in the same patterns and behaviours if certain conditions repeat.

There is, however, a second type of Computer generated narrative which makes use of non-deterministic game AI techniques and does not rely on event generation dependent on variables. This can be defined as emergent narrative exploiting the use of non-deterministic methods such as Artificial Neural Networks (ANN) and Genetic Algorithms. In this framework, the same sets of values and conditions can give different behavioural responses. Simulation

games, by contrast, will generate the same type of non-scripted narrative under the same conditions. In the history of video game design, a very limited number of titles have employed non-deterministic AI techniques, such as *Creatures*, (Grand, 1996-2001) based on artificial neural network and genetic algorithm, and the creature entity in Molineux's *Black&White* series (Lionhead Studios, 2001-2005) leading to less predictable behaviour with the potential for emergent narratives.

4. Conclusion

The analysis carried out in this study aims at providing a clearer picture of how games can tell stories by producing a model of four distinguishable architectures defined as Pre-established, Discovery, Sandbox and Computer-generated. While these are occasionally touched upon by the related literature, there is rarely any distinction and no mention is made of their close link to game AI. This leads to an often confusing picture which can generate excessive speculations of what video games can do in terms of storytelling and is in contrast to designers' clear awareness of the narrating methods permitted by the medium.

To circumvent this problem, this study proposes to define the storytelling boundaries and describes each category as bearing specific properties and encouraging a different story experiencing among the audience. Its aim and contribution is to provide a useful and clear model of game narratives as a stable reference for future studies on the subject.

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