Between Procedures and Computer Games: Semiotics of Practices as a Unifying Perspective

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Abstract

The debate on the most heuristic methodology for an academic study of competitive practices in computer games is open. Different disciplines, akin in some respects to semiotics, are tackling this issue — from formal ludology to procedural criticism. In this fragmented landscape, a semiotics of practices can provide a unifying point of view over those methods. Computer games can be thought as interactive matrices, narrating machines with which (and against which) players engage in competition — producing at the same time meaning-effects. The mutual interaction between playful practices, machine-side procedures and semiotic strategies for player engagement will be explored, sketching a preliminary semiotic framework for the analysis of games.

Introducing an academic perspective on computer games — a research field still shunned by some colleagues — may need a number of pre-emptive justifications. Vice versa, several game scholars have an outdated view of semiotics as a discipline too focused on linguistic meaning to be applied as a heuristic tool for analysing games. This work aims at demonstrating the opposite, as it is part of an ongoing research on how the major theoretical approaches to video games — ludology, procedural criticism, unit analysis — may be applied together with semiotics.

Different key issues point towards the academic relevance of electronic games. It is possible to mention, amongst others, their unstable textuality, the presence of both cooperative and competitive practices taking place between users and computer systems, the unusual syncreticity between their audiovisual and ergodic elements and, finally, a decade-long debate about narration (or lack thereof) in video games. Also, from an industrial point of view, the market for electronic entertainment is solid and — in the last years — both mainstream software houses and highly creative underground movements have been exploring different alternative niches, experimenting with new technologies and challenging established conventions and expectations.

To represent the ongoing multidisciplinary dialogue, a few key theoretical stances will be sketched, highlighting affinities and divergences, arguing for the centrality of some notions such as practice and situatedness and trying to recompose the debate on narration in games from a semiotic perspective. Finally, a short analysis will be presented as a practical test for the multidisciplinary methodology that is being developed.

1. AN ONGOING DEBATE

Neo-Aristotelian poetics and drama theory were one of the first paradigms for a narrative description of human-computer interaction. A second research strand derives from Propp's seminal work, in which he maps a finite number of plot functions appearing in a constant order in a corpus of Russian fairy tales: several researchers, starting with Dundes (1965), attempted to program Proppian algorithms to mechanically produce new tales. As it is possible to note, the first academic approaches to games were, at the same time, trying to translate a descriptive system from other domains and employing a distinctively narration-centric point of view — in response to this, a current called *ludology* argues for an approach exclusively focused on human-computer playful competition. To complement ludological formalistic analyses, it is also possible to describe the algorithms, the procedures, composing a software or a game: procedural criticism and unit analysis pursue this research direction. Finally, it will be assessed if and how both generative and pragmatist semiotics can integrate themselves in this fragmented landscape.

1.1. Brenda Laurel and the neo-Aristotelian approach
Brenda Laurel comes from a varied background, with academic training in performance studies and different work experiences — at first in independent game-design companies, later at the Atari Research and Development Centre and finally as a designer for usability and human factors. Her mixed competences put her in a privileged position to formulate her famous metaphor

aligning digital environments with theatrical representations — a suggestion that will spur research, debates and criticisms in the following years. Her fundamental book, «Computers as Theatre» (Laurel, 1991), highlights the similarities between the activities of playwriting and designing interactive systems. Starting from such consideration, Laurel proposes a set of notions for describing human-computer activities derived, with a rationality that is more practical than strictly philological, from Aristotle's Poetics and its re-readings in theatre theory (Freytag, 1895) and in professional playwriting handbooks (Smiley, 1971). On one side, she argues for her «computers as theatre» metaphor, adapting critical and analytical tools from performance studies to study electronically mediated interactions. On the other, Laurel tries to transform the descriptive system she just proposed into a prescriptive one, operative instructions for designers and evaluation criteria for effective user experience.

Such a foundational work, written in 1991, has been instrumental in opening the field of computer game studies to the humanities — but is hardly immune to ingenuities and other problems. To begin with, the analogy between computer-mediated interaction and dramatic performance is presented without being thoroughly problematized. Laurel writes the majority of her book highlighting the similarities between the two, without dedicating a comparable effort to discussing their differences — an approach that, as we will see, ludologists criticize. Furthermore, some of her examples are too ample overgeneralizations, putting word processors side by side with graphic adventure games and attempting to find a dramatic common ground amongst them. Finally, several semiotic concepts that are implicitly present in Laurel's work — such as narration, practice, figurative, plastic — are either in their naive form or in outdated Aristotelian formulations.

1.2. Proppian tale engines

It is possible to artificially create new plots of an unlimited number. All of these plots will reflect a basic scheme, while they themselves may not resemble one another. In order to create a folktale artificially, one may take any A, one of the possible B's, then a C, followed by absolutely any D, then an E, then one of the possible F's, then any G, and so on. Here, any elements may be dropped (apart, actually, from A or a), or repeated three times, or repeated in various aspects. (Propp, 1968)

Propp's bold statement about creating an unlimited number of new plots has stimulated the writing of different software prototypes — from Dundes and Grimes' first automatic Proppian plot generator (Dundes, 1965) to several following implementations. Further advances in computer technology allowed real-time, situated practices of narrative co-creation through a type of software called *story manager*. In particular, the Opiate system (Fairclough, 2004) — Open-ended Proppian Interactive Adaptive Tale Engine — aims at an implementation of functions, plot moves and spheres of action as close as possible to the way they were detailed in Morphology of Folktales applied to a digital environment in which users may freely inter-act with computer-generated characters. It scans the virtual space moment after moments and directs non-player characters — making them act in a way so that the user's practice have an appropriate narrative closure.

Story directors represent a concrete example of how humanities and software engineering can complement each other to design software that could be used with expressive, artistic purposes. A recent system, Façade (Mateas, Stern 2003), received positive criticisms — winning the Jury Prize at the Independent Game Festival — for effectively combining a Proppian tale engine with a compelling narrative. However, ludologists argue that those kind of computer programs are not primarily ludic and call for a completely different, game-centered perspective.

1.3 Ludology

A number of researchers, defining themselves as ludologists, argued — in the first issue of Game Studies — for a crucial gap between «game» and «story». Espen Aarseth complained that «[while] games are not a kind of cinema, or literature, [..] colonising attempts from both these fields have already happened» (Aarseth 2001). They criticized «narrativists» — as they labelled the other researchers in the field — for applying unfit theoretical tools from narratology and performance studies, for using naive and outdated definitions of what a «narrative» is — forcibly broadening them to encompass computer games — and for overlooking the essential pragmatic, competitive features of playful practices.

While literary works, movies and computer games all present characters and plots, a narrative is also defined by other elements such as narrator and narratee which are not — Juul (2001) claims — necessarily present in games. In the end, ludologists argue in favour of leaving «stories» out of academic inquiries on games: «[they] are just uninteresting ornaments or gift-wrappings to games, and laying any emphasis on studying these kinds of marketing tools is just a waste of time and energy» (Eskelinen 2001). Therefore, ludology turned into a formal methodology (Jarvinen 2007) that considers the possible combinations of game elements, mechanics and goals — leaving every narrative aspect aside. What has — for instance — Tetris to do with a story? Ludologists claim that focusing on the pragmatic aspects of Tetris' gameplay is going to be way more fruitful.

1.4 Algorithms, procedures, unit operations

An algorithm is any well-defined computational procedure that takes some value as input and produces some other value as output. We can also view algorithms as tools for solving a well-specified computational problem describing a specific procedure to achieve the desired input/output relationship. Algorithms may be specified in plain English, or as flowcharts or even as hardware designs. The only requirement is that the implementation must provide a precise description of the computational procedure to be followed. What are commonly called computer programs (including, therefore, video games) are essentially algorithms telling the hardware what steps to perform in which order to carry out a task.

Janet Murray, literary critic, identifies four essential properties of computers as a representational media: they are procedural, participatory, encyclopaedic and spatial (Murray 1997). While the other three properties play some roles in various computational media, procedurality appears to be their essential, defining one — referring to the algorithmic nature of computers, their ability to enact very complex cause-effect processes. In her influential book on procedural authorship, Murray argues that writing for an interactive system means both specifying what is going to be actualized and the algorithmic rules according to which the system may,

or may not, produce certain outputs. «It means — she writes — establishing the properties of the objects and potential objects in the virtual world and the formulas for how they will relate to one another. The procedural author creates not just a set of scenes but a world of narrative possibilities» (Murray 1997).

Procedural criticism, therefore, analyses systems examining the way they respond to certain events, thus satisfying the ludological demand of concentrating on the specificity of interactive media but considering also the narrative outcome of games. However, in her thought-provoking work, Murray focuses more on advocating for the literary dignity of interactive storytelling by imagining future applications of digital technologies to artistic expression rather than suggesting a set of tools to study current electronic games.

Bogost (2006) further expanded the study of procedures outside interactive electronic media, calling for a general application of procedurality. Recognizing unit operations as generalized procedures leads to consider «any medium — poetic, literary, cinematic, computational — [...] as a configurative system, an arranging of discrete, interlocking units of expressive meaning». Unit analysis, the expansion of procedural criticism proposed by Bogost, is the practice of recognizing units across different media, ranging between ludological formalizations and intertextual narrative readings, creating a common ground for computational and non-interactive systems.

1.5 Generative semiotics

In a recent work dealing with narrations in *edutainment* games (Ferri, Fusaroli, 2009), it was argued for a distinction between *post-hoc* perspectives and more situated, *in fieri* semiotic analyses. The notion of meaning and meaning-effects as results of an articulate trajectory, postulated by structuralist and generative semiotics, were evaluated in relation to an interactive, situated gaming practice. The Canonical Narrative Schema (Greimas, Courtés, 1979), originally articulated in the four phases of Manipulation, Competence, Performance and Sanction, requires a recognizable system of actantial positions — for example destinant, destinee, subject, anti-subject and object. Such interdefined positions are recognized through a comparison of opposing moral values coupled to actants: if the subject/protagonist endorse a particular moral stance and acts accordingly, actants embracing the opposite value are bound to be anti-subjects. It is a system based on direct, mutually exclusive oppositions where «not-A», if considered in relation to «A», automatically implies «B» and not every other potential entity (Paolucci, 2007). «What the schema does not consider is the constitutive instability of human actions (interpretive ones included), their having multiple possible unstable rationalities at once, the openness of meaning-construction processes, the inextricable mixture of the story and the practice that constructs it» (Ferri, Fusaroli 2009). Generative semiotics needs to construct its objects of analysis from a *post-hoc* perspective to be able to recognize and assign actantial roles: how to understand how meaning is constructed during play? How to explain that many games continue to be meaningfully fun even after having been played several times?

1.6 Habit-based analysis

After having critiqued generative semiotics for being at odds with the constitutive situatedness of computer gaming practices, a point of view derived from C.S. Peirce's pragmaticist semiotics seems more likely to produce adequate, *in fieri* descriptions of play experiences.

Habits (CP 1.148, 1.157) have already been discussed in relation to computer games (Ferri, Fusaroli 2009), describing them as dispositions to act, or to interpret, or even to perceive in a certain way in certain situations. Such tendencies shape the relations between a subject and his/her environment — but at the same time they may be reinforced, altered or also diminished through the repetition, or lack thereof, of a certain activity. In this respect, they are flexible dispositions — not stable, fixed rules — and may be used to represent how meaning is produced in a gaming practice. Thinking in terms of habits and tendencies helps us to understand why it may be meaningful to replay a certain game. It is not only a matter of developing an adequate set of dispositions in order to successfully complete it: a pragmaticist semiotic perspective tracks the emergence of habits and accounts for the development of meaning-effects through subsequent play sessions.

2. ANALYSES

Oiligarchy (Pedercini, Molleindustria, 2008) is a Flash-based management game; World Without Oil (Independent Lens, CPB, 2007) was an online Alternate Reality Game that was played in May 2007 — both dealing with oil extraction and consumption. While they may seem different, both of them generate a sense of uneasy similarity between what happens during gameplay and what could happen to the real world. Ludology alone cannot find a common mechanics between the two titles and a narratological analysis stalls after noticing common thematic elements. An interdisciplinary approach combining the semiotic notions of practice (Greimas, Courtés, 1979), assumption and habit (CP 1.148, 1.157) with *diegesis* (Genette, 1972) from narratology will be used alongside ludology and procedural criticism to explore meaning-making strategies in Oiligarchy and WWO.

2.1. Ludological insights

A ludological analysis (Jarvinen 2007) may describe Oiligarchy as a game of resource allocation and management, requiring players to optimize certain variables in relation to simulated events. Specifically, it represents an oil-extraction corporation; the main parameters to be considered by players are placement, number and size of oil rigs, the amount of money to be spent for lobbying and some special actions like interfering in foreign politics. Players, in a tutorial, are instructed to maximize profits «by any means necessary». However, the winning strategy for the first half of the game — building as many rigs as needed — becomes impossible to sustain in the last part. Trying to continue using it leads to worse and worse scenarios, ending with a massive nuclear war. To avoid such conclusion, players should change tactics: gradually diminishing oil extraction and stopping their political interferences. This practice eventually leads to a situation in which the player's character retires because oil is not a necessity anymore.

Alternate reality games are, from a ludologic point of view, games of progression, designed to be played only once by a large number of users at the same time. Their main mechanics usually consists in gathering and decrypting informations across several media — occasionally requiring physical performances to be executed in the real world to access some clues. No significant competition takes place amongst players: they need to cooperate

and coordinate their efforts to complete difficult challenges. Like many other ARGs, World Without Oil features a trailhead, or prelude: in this case, eight fictional characters learned about an imminent oil shortage and started preparing for it while documenting their activities. Usually a trailhead contains the first puzzle of the sequence constituting the game. On the contrary, the creative agenda suggested to the participants of WWO focused on exploring the simulated reality rather than on the game itself. Users were asked to roleplay inside the diegesis defined by the prelude, writing blogs and diaries as if an oil crisis was really underway. Every player-generated contribution was accepted as real in the game world — in the same way tabletop roleplayers' sentences are treated as performatives in gaming situations. The setting of WWO rapidly became richer in details, as users imagines demonstrations, riots but also novel ways of living, travelling and working without fuels.

2.2. Intradiegetic and extradiegetic dispositions

Considering how model players are disposed to enact certain gameplay practices is an interesting heuristics for game analysis that will help us to better understand Oiligarchy and WWO. It will be shown that some key habits, supported by both games, aim for practices outside conventional gameplay. For this specific analysis, two set of tendencies will be considered: intradiegetic and extradiegetic play. The former implies a separation between other activities and gameplay-related practices and interpretations; the prevalence of this assumption positions a system amongst the discourses of entertainment. Extradiegetic play, on the other hand, allows practices suggested by the game system to interpret, to relate to, to act on other semiotic objects from the outside.

In previous works (Ferri, 2009), as well as in other literature dealing with Alternate Reality Games (McGonigal, 2006), intradiegetic and extradiegetic sets of habits were labeled «This is a Game» and «This is Not a Game». However, further insights suggest that such convention might have been inappropriate as too focused on computers. For instance, while computer-based gameplay practices usually do not involve elements other than those actualized by their specific software, the same is not true for different types of play practices, such as children's make-believe games. Finding a simple boundary, a necessary and sufficient condition, to discriminate amongst games and not-games is a much more difficult task that would probably require a more complex, holistic approach. The study of these two tendencies and of the crucial re-routing moment between them will let us focus on how both games make sense.

Intradiegetic habits are first supported in the tutorial at the beginning of Oiligarchy. «World War II is over and the future looks bright for the West. Your new office is on the top floor of one of the biggest oil companies in the world. Your task as CEO is to turn that black sticky stuff by any means necessary. [...] Now you know the basics and you should be able to run a booming business. At least, until the oil production will start to decline. At that point, things might get a little crazy...». This short text primes the initial expectations, tactics and objectives for gameplay practices, also drawing a strong moral disposition inside the diegesis. Obtaining the maximum profit is, thus, a euphoric objective, a value so strong to cancel the ethical implications of what is done to accomplish it («by any means necessary»).

The algorithmic procedures (Murray 1997) governing Oiligarchy are set up so that following the «optimal» strategy suggested in the tutorial yields goods results until the oil availability

starts to decline. After that moment, two key parameters enter the game: on one side oil exhaustion, the degree to which natural reservoirs have been used; on the other side oil addiction, an index representing how dependent from fossil fuels Western societies are. An ideal gameplay practice, as primed by intradiegetic dispositions and by the «profit as the supreme good» set of values, will keep on maximizing oil extraction to satisfy addicted societies in spite of the impending scarcity. This will conceivably attract players towards more aggressive policies to keep the offer/demand ratio in check. Finally, in the second half of the game, algorithms in the simulation stop allowing such gameplay practices — leading to a final scenario involving a global nuclear exchange.

That could be a turning point in experiencing Oiligarchy, a re-routing of assumptions and practices. The moral priming given by the tutorial may have framed certain in-game actions allowing players to consider them as positive even if culturally shared values would stand against them. However, bringing the game to a scenario with a nuclear «mutually assured destruction» conflicts not only with extradiegetic ethics, but also with the previously-assumed intradiegetic one — as the end of the world is clearly also the end of the game.

Players may, afterwards, re-play Oiligarchy — this time ignoring or re-interpreting at least part of the originally proposed quest for maximum profit. Several phases of trials-and-errors are plausible at this point. Given the implicit failure of the intradiegetic «maximize the profits» stance, users are supported in their experiments with other alternative, extradiegetic strategies — until they reach the one rewarded with a more optimistic final scenario.

A similar semiotic mechanism is at work also in World Without Oil. Alternate Reality Games are a relatively recent phenomenon but it is already possible to trace some hypotheses on their prototypical form. Their main game mechanics include following a cross-media distributed narrative, solving puzzles to obtain some necessary informations and finding hidden links to proceed from one segment to another. It is possible to identify a degree of procedural authorship (Murray, 1997) in ARGs even if the algorithms regulating them are relatively simple and often enacted by human game-masters rather than implemented in software. Hidden links are an example of this procedural simplicity — as the corresponding algorithm may be a basic if-then clause causing certain clues to appear on screen when, for instance, the mouse cursor hovers on a specific area. Other algorithms may not exist in software but be implemented in human practices — as actual actors and performers may be used to interact with players.

Even if they are distributed across different media and played by many users at the same time, conventional ARGs still feature an intradiegetic narrative development, regulated by the game-masters' procedural authorship through intradiegetic puzzles. A significant difference separating video games and ARG gameplay practices is the fact that the latter allows extradiegetic competences and resources to be used as tools to solve in-game problems. For example, the famous «I Love Bees» ARG presented to its users a set of times, dates and geographic coordinats identifying pay phones scattered across the United States. They rang at the specified times and, if somebody answered, he would have heard a fragment of narration. Also, small tasks — like providing a correct password — or more complicated missions — such as recruiting a number of people and have them show up in person at the phone location — were usually required.

WWO takes this semiotic, meaning-making strategy a step further. Diegesis is estab-lished with the premise, the trailhead of WWO telling about the impending oil crisis. It is also regularly reproposed, revamped with announcements reporting the current (intradiegetic) fuel prices and highlighting some particular events amongst those imagined by players on their blogs. Users expecting a common ARG are quickly frustrated by the lack of explicit challenges. There are no centralized intradiegetic puzzles proposed to every participant. Few generic real-world missions are proposed («try to create a vegetable garden on your rooftop») but there are no mysteries and no puzzles to be solved. Procedural authorship is different from other ARGs: instead of suggesting shared tasks to the community, the trailhead is used to turn each participant's everyday practices into specific problems to be solved.

2.3. Figures of uncertainty

Oiligarchy and WWO adopt similar strategies to erode the independence of intradiegetic gameplay practices. First of all, both game systems are organized so that competence acquired within the ludic diegesis is not sufficient nor effective. On one side, the mission and the moral assumptions suggested by the tutorial in Oiligarchy — make money no matter what — are misleading and prelude to the end of the world. On the other one, WWO does not even provide detailed procedural guidance except for the trailhead and relies on the know-how that users may obtain from other sources and share amongst themselves.

Also, both games discourage a suspension of players' disbelief — as there are no com-pletely implausible narrative elements, at least in the key parts of their unfolding. At the same time, both systems may reach, through gameplay practices, certain configurations bearing intertextual similarities with disphorically charged topics of journalistic discourse — such as wars in Middle East in Oiligarchy or Katrina-like civil unrest in WWO.

Finally, the degree of control that users, through gameplay practices, may exert over the narrative unfolding of the two games is limited. In Oiligarchy, only a few final scenarios are possible — the end of the world, a dystopian recession or, hopefully, the obsolescence of oil extraction — but players cannot experiment further. Agency (Murray, 1997) is, in this very specific sense, even more limited in WWO — whose participants could do almost anything except directly solve the energy crisis: the focus is not on a heroic solution for the catastrophe but rather on imagining, describing and sharing ideas and stories of survival.

These three procedural and semiotic figures support meaning-effects of ambiguity, as if these games were oscillating between journalistic and entertainment discourses. A gap of uncertainty, of uncanny similarity between reality as narrated in the news and as simulated the games, emerges when intradiegetic and extradiegetic assumptions clash, collide or overlap (Ferri, Fusaroli, 2009).

3. CONCLUSIONS

Oiligarchy and WWO generate ambiguity and uneasiness by supporting, at first sight, gameplay practices based on intradiegetic habits — while actually extradiegetic are the most adequate ones. Examining how gaming practices in the two games are rerouted from intradiegetic to

extradiegetic expectations and values, we can now focus on the conceivable consequences of these meaning-making strategies. The pragmatist semiotic notion of habit is crucial to represent such consequences for players. C.S. Peirce defined habits as tendencies to interpret, act or perceive in similar way in the future; their utility for this analysis is that they are not fixed, deterministic rules but rather flexible dispositions. Interpretive processes, according to Peirce's model, produce other signs (process of semiosis) and habit-changes, modifications of someone's tendencies towards action. It is now finally possible to give a more satisfying description of Oiligarchy and WWO as systems designed to promote the grounding of new habits. When intradiegetic assumptions fail to yield the expected results, their rerouting also produces certain habit-changes. Through the games, players explore risks (war for more oil reservoirs, as represented in Oiligarchy), difficulties and their possible solutions (such as ideas for more fuel-efficient transport, as they were crowdsourced in WWO). Such systems operate as premises on which new, potential habits for dealing with a future without oil are developed. Or, in other words, quoting a blog post[2] that was part of the WWO game, to «hope for the best but prepare for the worst».

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