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Narrative Constitution for Instructional Game Design:

The Semiotic-Cognitive Model of Narrative

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Introduction

Serious and learning game design in itself is a highly interdisciplinary challenge—both practically and explanatorily. Then how can the player’s learning be supported by narrative in instructional game design?¹ To be more precise, how could the narrative constitution be modeled so that an instructional game designer could utilize, for example, the distinct narrative theories, from classical narratology, cognitive narratology, and psychoanalytic (literary) theory? The main challenge is that the concept of narrative used in distinct disciplines of narrative studies is often defined in differing ways. Currently, the research discussion considering narrative utilization as a learning support in serious and learning game design tends to be quite fragmental.

In this article, I propose a model of narrative constitution, through which two separate narrative theory lines from narrative studies could be put into perspective to construct a working framework for the instructional game narrative designer. The main emphasis will be on putting the two approaches into perspective in respect of each other. I call the model

the Semiotic-Cognitive Model of Narrative. The model is proposed as a powerful aid for practical instructional game design, because by applying it it is possible to separate and point out the objects of narrative design, which together with game rules constitute the context of game narrative. The meanings of game narrative constructed by the player during game playing must largely be designed indirectly, as player's ponderings and meaning negotiations have to be forecast by the game designer. In narrative learning games, however, those ponderings and meaning negotiations can be central for what may be learnt during game playing. Besides, the model could help the game designer to manage multiple cognitive prerequisites and advantages the narrative mode entails for its author and the recipient. Thereby, utilizing the model, it could be confirmed that the learning objective is deeply and appropriately incorporated in the game design.

After summarizing the applied ideas from the semiotic and cognitive approaches to narrative, I will scrutinize how the coherence between the two approaches is constructed in the form of a composite model of narrative constitution. The proposed model consists of four areas that participate in narrative meaning making and in which the narrative designer has to operate. After introducing the Semiotic-Cognitive Model of Narrative, I am going to discuss tentatively how the model could serve as a conceptual tool in the encounters of theory and practice in instructional game narrative design.

Narrative as a Semiotic-Cognitive Phenomenon

In respect of the possibilities of narrative constitution and narrative utilization as a support for learning, the instructional designer has to ponder narrative from at least the following viewpoints:

- an end product, a work
- a process of narrating
- a text, which produces its meaning using several semiotic codes
- a cognitive artifact (an aid for more effective cognition)
- a mental tool of cognition (a mode of thinking)

As an end product, the content element of narrative communication comes to the fore. In the structuralistic context, it is often defined that to be recognized as narrative, there has to be *a change of a state or a situation*. According to Wolf Schmid (2003), when using a broad definition of narrative, there should be nothing more added to this definition: a text representing a change (or changes) of state(s), where “a state” means “a set of properties which refer to an agent or to the setting at a particular point in time” (19). Further, according to Schmid (2003), in the narrower sense, narrative denotes a story and implies or explicitly represents a narrator behind it. “The story,” there, includes the changes of state as well as the static elements, i.e., “the states or situations themselves, the settings and the agents or patients within them” (Schmid 2003: 21).

According to Seymour Chatman, the “transposability of the story is the strongest reason for arguing that narratives are indeed structures independent of any medium” (1978/1986: 20). Marie-Laure Ryan (2004, 2005a, 2005b) points out that if narrative is considered to be a media-independent phenomenon, then it has to be recognized as a cognitive construction. According to Ryan (2005a), this response to *narrative stimuli* is a mental image that represents the world, where agents (characters) and objects exist and where at least partially unexpected changes of state emerge. These can be accidents and/or actions and occur in both

physical and mental stages.

But, if we now have a picture of requisite *story components*, what kind of semiotic structures cause the narrative meaning construction? John Pier (2003) translates and cites Claude Bremond: “The narrative (*récit*), without which there cannot be a ‘narrative message,’ tells (*raconté*) a story (*histoire*) that possesses a structure ‘independent of the techniques by which it is taken over.’ . . . ‘[t]he *raconté* has its own signifiers, its *racontants*: these are not words, images or gestures, but the events, situations and behaviors signified by these words, these images, these gestures” (78). Pier (2003) further explains that the Saussurean components of a linguistic sign, *signified* and *signifier*, cannot be equated to the story content and its telling (*raconté*), respectively. This is because, although narration utilizes primary sign systems (for example, written language or audiovisual icons), narrative meanings are produced on the second stage signification. In contrast to the Saussurean components of a linguistic sign, in the context of narrative (*récit*), the story constituents (events, situations, and behaviors) act as *narrative signifiers* (i.e., *racontants*), and the told (*raconté*) acts as *narrative signified*.

In Bremond’s discussion, “narrative telling” is considered separated from the material representations of different media forms using words, images, and gestures (qtd. Pier 2003). Yet in this respect, Bremond’s approach seems to be comparable to how Saussure initially approached the parts of a sign of linguistic language as completely psychological objects (Saussure 1972/1990: 66). Thus, as *narrative signified*, the telling shows its nature as an intentional act, which means that, bound to the operations of narrative interpretation, there is a valid expectation that a story’s content is not a randomly selected bundle of elements (which meets the before discussed criteria of story components), but rather, whatever the story content includes, it is a result of meaningful choices. Hence, the *raconté*, the told, can be considered as being composed of and interpreted as *a structure of functions* stemming from Vladimir Propp’s

Morphology of the Folk Tale (1928/1968). Propp defines the concept of function as “*an act of a character, defined from the point of view of its significance for the course of the action*” (21). This leads to the characteristic of narrative, which Bruner (1996) calls *ambiguity of reference*: “What a narrative is ‘about’ is always open to some question, however much we may ‘check’ its facts. For its facts, after all, are functions of the story” (140).

In respect of narrative meaning, the characteristic of having the story components, constructed as mental pictures and turned to functions, means that there are both denotative first-stage meanings and connotative second-stage meanings. Thus, it is the second-stage meaning that cannot be constructed by the story recipient conclusively until he/she is ready to determine, or at least to tentatively negotiate, the story functions, i.e., which of the story events are the more decisive ones for the course of events—called cardinal functions (Barthes 1966/1975: 248) or kernels (Chatman 1978/1986: 53)—and which ones are rather complementary—called catalyses (Barthes 1966/1975: 248) or satellites (Chatman 1978/1986: 53). Espen Aarseth (2012) proposes the application of ‘kernels’ and ‘satellites’ in digital game narratives and proposes a division into four game types based on the player’s possibility to have an influence on the course of the story events in relation to the types of story functions of the event influenced.²

Above all, the layer of narrative functions challenges the idea of digital game narrative design as so-called scenario design. The viability of the aim to design complicated but coherent and good quality stories by creating the story events as independent entities, which could be connectable with several other scenarios instead of being just a link in a chain, depends significantly on how the former scenarios, and the ones following, produce meanings through the connections *between* them. In other words, how a certain combination and the order of actualized story events affects the meaning of a single story event and thus what function the event gets in

the entirety of the story. Is, for example, a change of the order of two story events a matter of discourse or a matter of story content? Not to mention the replacement of one entire story event with another.

To sketch the cognitive features and potentials of narrative as a cognitive artifact and a mental tool, we have to also consider the cognitive side of narrative constitution. David Herman (2003a) presents a definition for *cognitive artifacts*, which are “material as well as mental objects that enable or enhance cognition” (1). The approach to narrative as a cognitive artifact rests upon the conception of understanding that it is “a process by which people match what they see and hear to pre-stored groupings of actions that they have already experienced” (Schank and Abelson 67). Scripts are the knowledge representations that store these finite groupings of causally and chronologically ordered actions—actions that are required for the accomplishment of particular tasks” (Herman 1997: 1048). According to Herman (1997), especially scripts, which are the dynamic type of “experiential repertoires” (1047) that the mind draws on, are essential to the comprehension of a text, discourse, or story. Scripts store stereotypical knowledge or expectations regarding how events in a particular situation unfold, whereas the static type of memory patterns, frames, store expectations related to a particular situation, which is a representation of a point in time. Narrative, for its part, provides a structure or, according to John A. Robinson and Linda Hawpe (1986), a story schema, in which isolated data can be connected to episodes, which means that various phenomena can be attached into causally and chronologically connected wholes (Herman 2003b; Robinson and Hawpe 1986). This lays grounds for what will be discussed next about the reception of narrative.

The necessity to include one’s own knowledge in the reading process can be seen as well from the viewpoint of *the principle of minimal departure*, as Ryan (1991) phrases it: “when readers construct fictional worlds, they fill in the gaps . . . in the text by assuming the

similarity of the fictional world to their own experiential reality” (447). Furthermore, the narrative meaning construction relies on the recipient’s knowledge related to other narratives and narrative media traditions. Chatman (1978/1986) separates *reading out* from mere reading, saying that “[t]his kind of ‘reading out’ is qualitatively different from ordinary reading, though so familiar as to seem totally ‘natural.’ But the conventions are there and are crucial” (41).

In the context of digital games, which employ a game rule apparatus, the whole composition of the narrative communication process has to be viewed from a novel viewpoint. This is because the role of a story consumer, which is that of a player, is strongly functional and purpose oriented. As Markku Eskelinen (2001) puts it in *Game Studies* (1), “in art we might have to configure in order to be able to interpret whereas in games we have to interpret in order to be able to configure, and proceed from the beginning to the winning or some other situation.” Thus, the interpretation process is influenced by the interactive features of digital games and the situation created by the game rules. Related to this, Aarseth (1997) has proposed the concepts of *intrigue* for considering the level of negotiations between story events and progression in adventure games: “a secret plot in which the user is innocent, but voluntary, target . . . with an outcome that is not yet decided—or rather with several possible outcomes that depend on various factors, such as the cleverness and experience of the player” (112). Aarseth proposes that the target of the *intrigue*, the implied user, could be called *intriguee*, the term being parallel to narratologists’ *narratee*. I propose that for closer discussions on a player’s ponderings and narrative and game playing -related meaning negotiations, the concept of *co-storyliner* could be taken to use. This concept is tentatively presented in Äyrämö & Koskimaa (2010) and can be further developed on the strength of the model proposed in the following section of this article. Especially for instructional uses of game narrative, forethought of this kind of meaning negotiations could be worthwhile.

Bruner (1991, 1996) notes that a crucial feature of a powerful narrative is that it—while recognizing, and thus even confirming, canonical understandings (and related narratives)—significantly breaches implicit canonical scripts (1991: 11, 15; 1996: 139). In this regard, there is already the term of classical rhetoric *inventio*, which refers to discovering some fresh or revolutionary subject matter or material. Invention and breaching canonicity explain why certain stories are worth telling and, at the same time, how narratives exist in implicit relation to each other.

Furthermore, Bruner (1991, 1996) further characterizes that when using the narrative mode of discourse or thinking,³ it is implicitly accepted that narratives create *versions*. This comports with Robinson and Hawpe (1986), when they describe how people utilize narratives, and the narrative mode of causal thinking, when constructing understanding regarding an experience. The story offers explanation, a relative truth, which is accepted with the awareness that there could be other stories constructed with alternative explanations. Thus, it is possible to take various approaches to the same subject matter through distinct stories. Besides, various versions of a particular story can represent a different comment or argument to the original subject matter, or the subject matter can even change. However, it is not clear where the boundary goes between being a version of a certain story or being entirely another story.

As regards the design of story constituents *the state of being selected* seems to be significant in respect of narrative signification. Wolf Schmid (2007) proposes a four-level model in purpose of structuring narrative production and specifying differing choices, which an author is expected to do when creating a narrative. Schmid names the four levels *Geschehen*, *Geschichte*, *Erzählung*, and *Präsentation der Erzählung* (Pier 2003). *Geschehen* consists of the totality informing situations, characters, and actions, which are represented explicitly or implicitly or which are implied logically through the narrative work (Schmid 2007).

This is the “implied raw material of narrative processing” (Schmid quoted by Pier 2003: 84). As an operation, *Geschehen* should be understood as an *invention* of a story subject (Schmid 2007). The next level, *Geschichte*, means the same as Tomaševskij with *fabula*: the selected events in *ordo naturalis*. As such, it is a result of *selection* regarding the constituent events and the particularities of them (Schmid 2007). The third level, *Erzählung*, is a result of *the composition* that organizes the happenings through *linearization* (temporal selections, acceleration, and deceleration) and *permutation* of segments in a synthetic composition, *ordo artificialis* (Schmid 2007). Only the fourth level, *Präsentation der Erzählung*, can be reached through empirical observation, as it is the perceptible representation of the *Erzählung* in a particular medium (Schmid 2007).

Finally, in search of the overall picture of narrative for the designer considering narrative design, it could be productive to bring together Schmid’s four-level model of narrative production; Bremond’s approach on *récit, raconté, racontants, and histoire*; and the cognitive approaches discussed above. Thereby, it could be seen how narratives produce meanings as semiotic-cognitively organized artifacts. Already, from the initial transition from the stage of “implied raw material” (*Geschehen*) to the second of the selected happenings in *ordo naturalis* (*Geschichte*), the practice of the artistic fashioning of narrative has begun. This is because the selections could not be done without first selecting the perspective in terms of, for example, temporal, spatial, and ideological possibilities or in respect of the perspective itself (that is, a story of narration, see more from Schmid 2007). The existences of narrative as a form of representation and as an everyday type of causal thinking and problem solving are tied together so inextricably that even the expectations of the naturalness of narrative mode (*the principle of minimal departure*) are accepted as being natural. However, despite the mimetic characteristic of narrative implying to the reader lifelikeness, every part of a fictional story must be observed as a

part of an artificial construct.

Furthermore, in human cognition and communication, narratives carry knowledge not just on the denotative first stage of meaning but on the connotative second stage, too. Thus, when we search the deeper understanding of the possibilities to utilize or “use” narrative as a cognitive aid, the fact that when we tell stories, we want to also communicate some other topic(s) by implication should not be excluded. Furthermore, in a playing situation, the reading of game narrative can require a player’s meaning negotiations in multiple relations, for example, how, in practice, the story components are connected to game elements, how playing actions can be put into perspective with the process of revealing or actualizing the story (obligatoriness and facultativeness), and how empathy to characters can be proportioned to the goals of the game. Thereby, the overall system of game rules and game narrative can produce complicated thematic meanings and arguments.

As Bruner (1996) states, “to understand what something ‘means’ requires some awareness of the alternative meanings” (13). It can be presumed that effective purpose-oriented narrative production requires some awareness of various possibilities on each level of narrative production pieced together by Schmid. Additionally, based on the concepts of Bremond, in order to take advantage of the deeper meanings of narrative, the designer must be capable of approaching the story contents as functions of the wholeness of the story. In the context of game design, these demands are further expanded by the potentialities of the digital mode of expression and the story recipient’s novel role and position in narrative actualization. In this novel role, however, it is possible that a player, as a co-storyliner, takes in hand some of the level operations Schmid specified, but from the game designer, this novelty requires exact design of *narrative potentiality*.

Defining the Areas of the Semiotic-Cognitive Model of Narrative

The tentative sketch of the proposed model was constructed in Äyrämö & Koskimaa (2010). The article presented the results of an analysis, where professional computer game designers' conceptions and definitions for 'narrative' were examined within a multidisciplinary narrative theory frame. . In the Semiotic-Cognitive Model of Narrative (see Picture 1), the composition of the model is further specified.

In the proposed model, narrative as a semiotic structure is considered to consist of the saussurean binary of a sign, having the sides of *signifier* and *signified*. To distinguish the differing areas on both two sides, signified and signifier are further divided according to the ontological dichotomy, *substance* and *form*.⁴ The four areas comprising narrative are *Material Representation and Multimodal Discourse*, *Response to Narrative Stimuli*, *The Story Components*, and *A Story as a Complex System of Facts* (see also Picture 1). It is through the coexistence of the areas, through continual dynamic interplay between them, that narration and narrative message are constructed in the production process as well as in the reading and interpretation of narrative.

| | SIGNIFIED | SIGNIFIER |
|------------|--|---|
| SUB-STANCE | <u>The Story Components</u> <ul style="list-style-type: none"> • World, objects, character(s), events, goals, challenges on the level of fictional reality • The emotional reality • The relationships between story components (the static elements) • Procedural knowledge • Can include also another story of the act of narration (narrator as a character) | <u>Response to Narrative Stimuli</u> <ul style="list-style-type: none"> • mental images, (further defined by Ryan 2005, 347) • the mental images turned into <i>racontants</i> • Witnessing |
| FORM | <u>A Story as a Complex System of Facts</u> <ul style="list-style-type: none"> • Story as a mental model • Story schema • 'To tell', <i>raconté</i> | <u>Material Representation and Multimodal Discourse</u> <ul style="list-style-type: none"> • The multimodal discourse of a game, requiring both interpretative and constructive participation from the player • Contains procedural means of expression • Operate as narrative stimuli |

Picture 1 The Semiotic-Cognitive Model of Narrative

The discussion will be illustrated using two high-quality commercial digital games, *Fable: The Lost Chapters* (Lionhead Studios 2005) and *The Longest Journey* (Funcom 2000). I have chosen to use commercial samples of narrative game design as, at present, narrative design of serious and learning games cannot compete with the quality of commercial game narrative design. The two games exemplify the two typical narrative game genres, namely role-playing games and adventure games. I am going to use examples only here and there, for unfortunately, it is not possible to present a full-length specification in the limits of this article.

From now on, I will refer to the above-mentioned games as *Fable* and *TLJ*.

The only area covering the “concrete” and perceptible surface of narrative is headed as *Material Representation and Multimodal Discourse*, and is positioned in the diagram as *the form of signifier*. In digital games, the area covers, for example, visual, auditory, linguistic, and tactile manifestations of signs, which for their part can rely on, for example, Peircean iconic, indexal, or symbolic reference relationships. Moreover, due to the multimodality, several signs can be presented one after another or simultaneously, and their denotative meanings can strengthen the narrative-related meanings under construction or set contradictions inside them. Besides, the options are further diversified with different styles of other art forms, which digital games include and utilize. Design solutions related to styles or thematic elements tie together, or construct dialog between, the perceptible manifestation of game narrative at hand and the expressional conventions (like futurism, or naïve style) or subject-related genres (like western or horror).

Along with digitality, in game narrative the design on the area of *Material Representation and Multimodal Discourse* also covers more abstract means of expression, for example, the hypertext structures, which can be isolated within game areas or stages as well as within the wider entirety. The area of *Material Representation and Multimodal Discourse* covers Schmid’s *Erzählung* and *Präsentation der Erzählung*. Thereby, in game narrative design, the design decisions relevant to this area relate, in addition to the questions of expressional techniques, to permutation of narrative events—or at least determining the elements of permutation—as well as the linearization of simultaneous events and setting the pace of the narration.

Fable offers us an example on the interaction design of the skill of shooting a bow. The procedure is divided into partially overlapping operations of pulling back

the arrow and aiming the shot (when it is possible to zoom in or out, also) and, finally, releasing it to fire. To put into action the bow shooting, the player must use appropriately given keyboard buttons, mouse, and mouse buttons. Hitting the target requires exact, timely sighting. Aiming the shot is illustrated through a transition to first-person point of view. Finally, in the narrative experienced during game playing, for example, the total amount of real time spent in touch of a single operation is an outcome of the player's decisions, and skills. Thereby, the player's participation through interaction becomes a part of the discourse of a game.

Generally, in respect of the transformability of a narrative between various media forms, *Material Representation and Multimodal Discourse* –related issues are considered to be the area where changes can subtly be done without necessarily influencing the identifiability of the narrative. The variability without causing a change of narrative is why the area is considered as *the form* (not substance) of *the signifier*.

If narrative is expected to function as a cognitive artifact, the material representation has to act as a narrative stimulus for its recipient. This causes a *Response to Narrative Stimuli*, which is a mental representation of a story, as tentatively defined by Ryan (2005a). Additionally, the mental representation of narrative requires the perceiving position of observation, the witnessing, without which the other parts of the mental representation could not be constructed. This position is created using selected narration-related means of expression (such as narrative point of view and voice) on the abovementioned area of *Material Representation and Multimodal Discourse*.

In practice, the creation of mental images already includes cognitive operations of filling in by one's own experience-based knowledge, and thus, the mental images of narrative can be experienced as mimesis. Moreover, when the process of mimetic experience (including recipient's real feeling-reactions) gets further, the story recipient – if prepared with

adequate narrative competence and game (and other media-related) literacy skills – will be able to “read her mental images” in order to construct the functional structure of narrative meaning. This is the second stage of narrative signification, the point where story components turn as narrative signifiers, functions, or *racontants*. When the narrative reception is unfinished, the recipient, yet, is able to speculate the functional roles of events and agents based on his existing knowledge of other stories (and stories in general) and the progression of events and the ending he foresees at each time. Thus, the mental images of story components constitute an essential part of the narrative signifier, and are in the key role in the construction of narrative messages. In the Semiotic-Cognitive Model of Narrative, the indispensable area of *Response to Narrative Stimuli* is considered as *the substance of signifier*.

Next, we move on to deal with the other side of the Semiotic-Cognitive Model of Narrative, the side of signified. The area of *the story components* covers elements of fictional reality. From the definition proposed by Ryan (2005a), it is possible to isolate the totality of the minimum requirements for the story components, including a world, agents, objects, events causing changes of state, and a link to mental events, which include goals, plans, and emotions. In game narratives, especially the story-related goals, plans, and emotions of characters constitute a special case, which can build a bridge between narrative and purely game-related meanings. This is because it offers an area where the player’s game-related goals, plans, and emotions can meet those of a player character (PC)—or construct some thought-provoking contrasts for the co-storyliner’s meaning negotiations. In the Semiotic-Cognitive Model of Narrative, *the story components* are considered as *the substance of signified*.

Deriving from Schmid’s narrative levels, the design on the area of *The Story Components* (including both *Geschichte* and *Geschehen*) cover the invention of some

particular form of fictional life; its inspection through a perspective, which includes appraisal of how some particular events originally evolved; and evaluative selections on what is worth telling. In the Semiotic-Cognitive Model of Narrative, the construction and perceiving of the inspective and narratorial perspective is a matter of the areas of the signifier side, but the person who observes, the more or less detectable narrator, is a matter of story content. Thus, it is possible that the narrative also includes another story of the act of narrating the story (like in *TLJ*, where it is hinted that the main character, April Ryan, arguably is the narrator of the frame story told through cinematic parts in the beginning and the ending parts of the game or, like is the case more substantially in Ian McEwan's novel *Atonement*, 2001, where it is revealed that the narrator has moral motives behind her narratorial act). At the same time, all the selections by which the components of the story are selected imply that there is always a lot more in the fictional reality, things that will never be told, and our implied awareness of them makes the experience even more believable. Again, from a game design viewpoint, this is an area where the designer can create options so that the player as co-storyliner can (more or less) decide whether or not some options are actualized as story components. In *Fable*, the player can select from an abundance of choices concerning pieces of clothing, weapons, items, hairstyles, settings and missions, and what is particularly of interest. Thereby, via his selections related to the PC's behavior and missions selected, he can define the PC's inner goals and plans as a hero meaningfully.

Moreover, applying Ian Bogost's (2005) term, narratives can convey *procedural knowledge*, yet Bogost highlights the special ability of the medium of digital games in this regard. As such, procedural games do not require game narrative. However, especially through narrative, it is possible to reveal the components of the fictional world, which function in relation to each other and thus constitute *a system that produces* the story events. Albeit—assuming that the issue at stake *is* narrative—primarily, the focus is rather on the story

events (what happened and why), as the events are essential to the existence of narrative. However, digital game narratives possess perhaps the best conditions *to join* the forces of procedural argumentation and the operations unique for narrative. For example, procedural knowledge gained when playing *Fable* concerns the effect chains, revealing that how you act affects people (and other creatures) surrounding you and comes back to you again. Furthermore, it reveals how the overall development stemming from these situations (according to the game) affects your habitus (which arguably also represents the character's inner growth). Furthermore, the composition of different options presents an outlook on what kinds of possibilities a hero's path may offer. Gaining this kind of knowledge requires experimental, constructive, and interpretative actions from the player during game playing, and further, it requires *meaning negotiations* between game rule- and narrative-related elements.

Finally, on *The Area of a Story as a Complex System of Facts*, which represents *the form of signified*, story as a mental model offers, at the very last, “judgment heuristic or ‘meta-heuristic’ . . . i.e. an assemblage of rules of thumb for interpreting experience” (Herman 2003b: 176). Furthermore, a story schema provides the means for problem solving in the form of categorizing components and types of relations, which can structure causal thinking, for example, by enabling the construction of narrative analogues (Robinson and Hawpe 1986). However, the construction of mental images of narrative (in the area of *the substance of signifier*) causes the activation of various “experiential repertoires,” such as real life experience –based frames and scripts. This kind of reading process, and construction of a mental model of a story (in the area of *the form of signified*), both activates and has an effect on the reader's existing knowledge of life and the world. Besides, if there were special schema-type structures of story content, for example Campbell's monomyth, which perhaps act in a particular function in human cognition (as proposed, for example, by Hokanson and Fraher 2008), those structures would

operate in this area of narrative signified.

As a design area of narrative, the area of *A Story as a Complex System of Facts* calls on the designer to be aware of what kind of socio-cultural background information and literacy skills (various media literacies, canonical stories, genre conventions, etc.) he is expecting from the hypothetical player. Besides, to construct a meaningful narrative message, for the designer it has to be clear which events are so-called story-defining events (kernels) and which ones are there only in some supplemental role (satellites). Regarding the possibilities to subsume interactive elements to each type of story function, for the game designer, there is the option of three game types, as proposed by Aarseth (2012), namely the linear game (using fixed kernels and flexible satellites), the hypertext-like game (offering selection between kernels and fixed satellites), and the “creamy middle” quest game (offering selection between kernels and flexible satellites).⁵

The two example games clearly bring out how the typical game genre conventions—especially the ways of representation, modes of game discourse, and the game goals—direct the player’s attention and expectations toward separate areas of narrative. *Fable* uses third-person point of view as a default but lets the player move the camera and adjust the distance in relation to the PC. Furthermore, there is a wealth of options by which the player can modify the PC’s equipment, skills, and appearance and, further, select quests (there are obligatory, as well as additional, quests) and thereby select or, at least, have an effect on the story events or, in other cases, the order of them. Additionally, as the hero-PC can often select his side (on the continuum of good, neutral, and bad) in the quests, there is an even broader optional space of total stories possible to actualize. Thus, the game offers a player the possibilities to empathize with the PC-hero, witness the character’s progression and future in the story, and examine the proceduralities of morale. When playing *Fable*, it is a strong motive that a player

feels that he can influence the outcome of the story progression that is actualized, even though there are a restricted number of possible predefined endings for the game. Thereby, *Fable* directs the player's attention widely toward various design areas of narrative: *Material Representation and Multimodal Discourse*, for example, through the camera options, *The Story Components*, for example, through item and event actualization, *A Story as a Complex System of Facts* through the player's detached negotiations on PC behaviors in particular situations and their probable effect to game playing and story continuum, and *Response to Narrative Stimuli* especially during the last mentioned negotiations, when player anchors her real-world situations (or other stories) –related knowledge.

On the other hand, when playing *TLJ*, April, the PC, is observed from a third-person point of view with the fixed camera angle positioned in most cases further from the PC than in the case of *Fable*. The player explores the story environment, talks with non-player characters (NPCs), and contemplates additional materials of The Diary menu. As the player's immediate task is to find out how to reveal more about the story (for example, by gaining knowledge from NPCs, finding and using items, exploring new locations, and solving puzzles), it is implicitly accepted that there exists a fixed, macro story, but also, the way by which April can reveal this global state, micro story, is also defined as “right answers.” Thus, it depends on the player how soon (and only partially, how) April finds out what she is supposed to do at each time and what, in general, is going on. With this enigma in its center, the composition of *TLJ's* game story is familiar from the narrative genre of mystery stories. In *TLJ*, the player's estranged position in relation to the PC is utilized inventively. Sometimes, April does something other than what the player proposes, or she just doesn't obey (for example, she says, “Not today,” if the player tries to have her paint when there is something else going on). Additionally, there is the diary menu including April's diary, where the player can read the events of backstory preceding

the first actual story events. Furthermore, the diary offers April's first-person viewpoint, depicted with her own words, on the days passed in the story along with game playing. Thus, when playing *TLJ*'s kind of game, it is especially motivating to elicit a captivating storyline and spend time with interesting characters. This kind of narrative design directs the player's attention especially toward the story functions, going in search of kernels, that is, the search for key events, by which the enigma is solved. The design of *TLJ* directs the player's interest, in addition to the area of *The Story Components*, with respect to playing activities, to the area of *A Story as a Complex System of Facts*.

Applying The Semiotic-Cognitive Model of Narrative on Instructional Game Design

I am considering a digital work as a digital game if it offers to its recipient a goal, the rules covering playing, and a possibility to reach a winning or a losing state. Thus, playing, as well as learning, can be seen as target-oriented activities. In narratives, then, at least the main character has some kind of more or less clear goal, and additionally, there are the narrational intention and the recipient's implicated intention to grasp the meanings of narrative.

In a learning situation, the target arises from a learning objective. Anderson et al. (2014) have defined various types of objectives of education and proposed a taxonomy for further specify various learning objectives. Through the taxonomy, the writers recognize a knowledge dimension including four types of knowledge (factual, conceptual, procedural, and meta-cognitive), and a cognitive process dimension, including six types of cognitive processes (remember, understand, apply, analyze, evaluate, and create). According to the writers, any learning objective can be recognized using the taxonomy, where the two dimensions are set to intersect. In a playing situation, the player's goal is tied together with her aim to gain *an agency* within the limits of game rules, and thereby, to achieve a procedural

understanding of a subject (Wardrip-Fruin 2009).

The playing experience as a final object of game design characterizes also creative game narrative design. Both game and narrative experiences can carry a lot of knowledge, not only in their outcomes, but also as processes. Thus, learning game narrative designer, especially regarding constructivist learning approach, should pay attention on points, where narrative design and game rule design intersect, as those are the significant areas for the player during game playing. In other words, those are the points, in which a player takes notice of, conducts meaning negotiations and constructs plans with a view to achieve agency. The story character's goals in the game narrative can be consistent, or different, with the player's actual objectives during game playing. Besides, the narrational intention can be excluded from, or included in, player's agency.

Since narrative design offers plenty of different possibilities for creating meaningful linkages to game rules, instructional game narrative design can benefit from the model recognizing distinct areas involved in the process and the end product of narrative meaning (making). Considering the game rule design together with the Semiotic-Cognitive Model of Narrative, the possibilities of potential-based game narrative, so-called ludonarrative (Aarseth 2012), could be taken into closer scrutiny regarding the indirectly pursued co-storyliner's ponderings and meaning negotiations. The various possibilities to create correlations (in other words, intrinsic relationships) between different types of learning objectives, game rules, and various narrative areas could be taken to closer inspection by applying the model as a tool of learning game analysis. Moreover, from an analysis tool, the use of the model could be further developed to support learning game design and assessment.

Conclusions

I have proposed the Semiotic-Cognitive Model of Narrative for the purpose of joining together several theoretical approaches to narrative, which at the moment seem to offer the most productive basis for instructional game narrative design. Through the framework of the model, the mechanisms and the areas of narrative meaning making, means of expression, and the cognitive tasks, impacts, and advantages of narrative can be considered side by side. Furthermore, the model brings out how in narrative, the act of telling and narrative meanings are interwoven with each other like the sides of the yin and yang sign. Despite the complexity of narrative as a semiotic-cognitive phenomenon, through the model, I have strived to capture and specify the essential areas of narrative design—the areas which, as well, can be harnessed to serve as links between game rules and the learning objective.

In the future, the possibilities to tie the co-storyliner's meaning negotiations with learning objectives can be contemplated more closely. The Semiotic-Cognitive Model of Narrative will be applied as a framework for qualitative analyses on various existing narrative learning games and player's meaning negotiations during game playing. By the analyses the role of narrative learning support in an existing game can be specified. Such analysis could, for example, strengthen the assessment process of existing learning games. Moreover, using existing instructional design models of learning objectives (for example, A Revision of Bloom's Taxonomy of Educational Objectives, see Krathwohl 2002, and Anderson et al. 2014), the relationships between particular types of knowledge, narrative areas, and various types of game narratives or narrative game genres could be further studied. Finally, using the Semiotic-Cognitive Model of Narrative new approaches and guidelines for learning and serious game design could be discovered.

Notes

1 This article is a part of a larger study that examines the topic encapsulated in this question.

2 In “Narrative Theory of Games,” Aarseth (2012) considers “narrative” and “ludic” as adjective-like extremities of a span, which characterizes the options of the design space of digital games. Aarseth’s use of the concept of narrative is not necessary compatible with the view proposed in this article, at least when it comes to defining the options of game agent design: “Agents can be presented as rich, deep and round characters (the narrative pole), or shallow, hollow bots (the ludic pole)” (130). According to my view, there is no reason to claim that flat configuring of story characters (agents) could not be included in narrative. Rather, flat characters often play as minor characters in supportive roles of the story or function as a vehicle of humor.

3 Bruner explicitly states that he cannot make clear separation between them because the relationship, in essence, is inseparable—just like the signified and its signifier of a sign in linguistic language in Saussure’s (1972/1990) discussion.

4 The categories proposed by the Semiotic-Cognitive Model of Narrative (form of signifier, substance of signifier, form of signified, substance of signified) are, actually, the same as in Seymour Chatman’s (1978/1986: 22) diagram about narrative, but, as can be seen in closer examination, the diagrams put into perspective partially differing contents and observe the narrative phenomenon in differing scale.

5 Additionally, the game types proposed by Aarseth (2012) include the fourth type: the nonnarrative game, which contains no kernels, and are considered just as games.

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