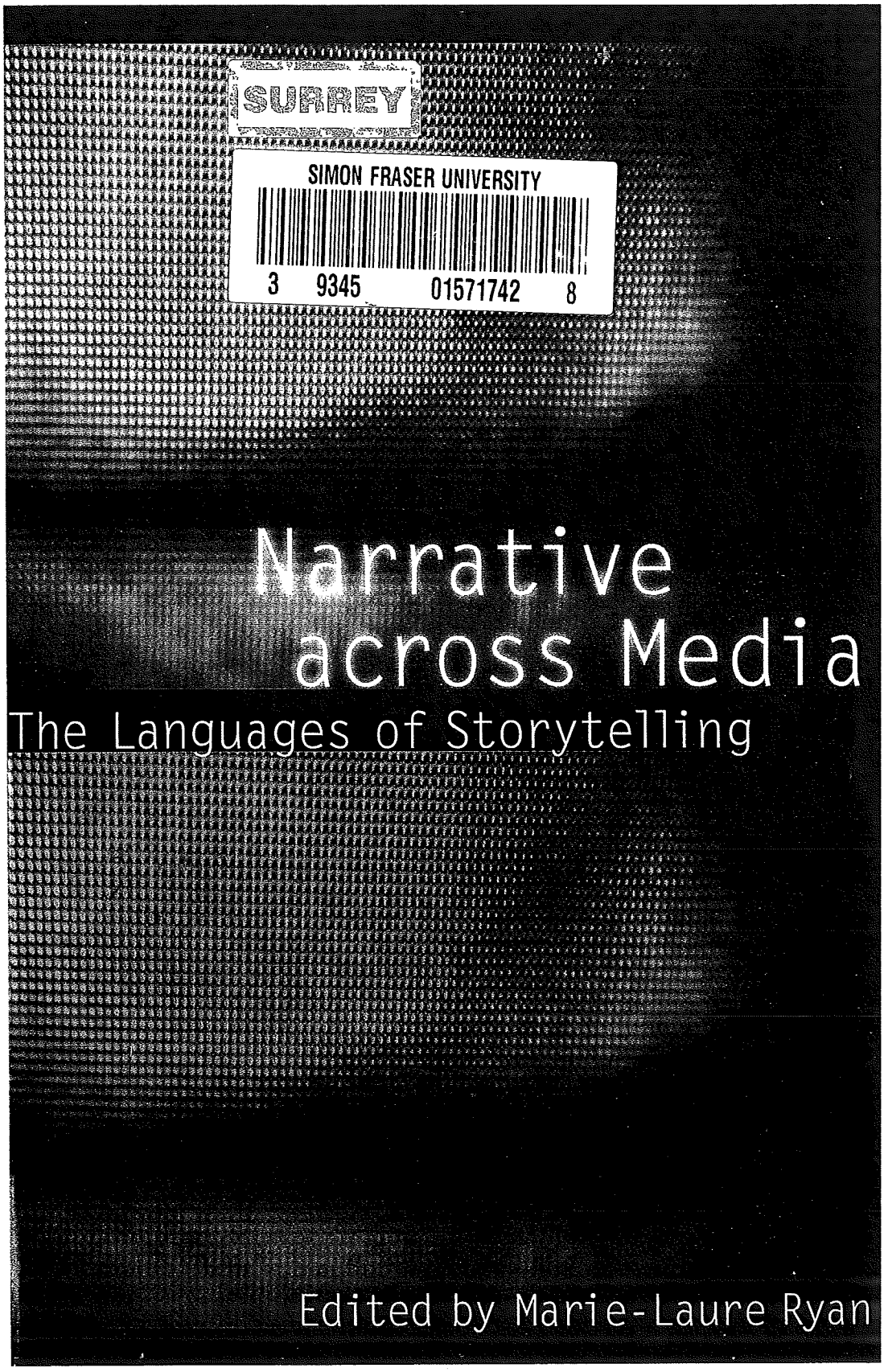

Narrative across Media

The Languages of Storytelling

Edited by Marie-Laure Ryan

12

Will New Media Produce New Narratives?

Marie-Laure Ryan

From the very beginning of the revolution that turned computers from business machines into poetry engines, the relation between narrative and digital media has been the object of contradictory opinions. Who should we follow: George Landow, who claims that hypertext will reconfigure the narrative experience by turning readers into coauthors; Janet Murray, who regards digital media as a new stage on which old narratives will be replayed in new dimensions (as the title of her book, *Hamlet on the Holodeck,* suggests); Espen Aarseth, who thinks that the future of cybertexts lies not in storytelling but in computer games; or Katherine Hayles, who equates digital meaning with complexity, fragmentation, fluidity, resistance to totalization, aporia, paradox, emergence, or self-organizing capabilities—features more likely to bring in a post-narrative, post-human literature than to transform the basic conditions of narrativity?

To start this discussion of the narrative potential of digital media on solid ground, three issues must be covered. First, we need to define *narrative.* Here I will work from the definition outlined in the introduction to this volume: a narrative text is one that brings a world to the mind (setting) and populates it with intelligent agents (characters). These agents participate in actions and happenings (events, plot), which cause global changes in the narrative world. Narrative is thus a mental representation of causally connected states and events that captures a segment in the history of a world and of its members. This logico-semantic characterization of narrative is sufficiently abstract to be regarded as a cognitive universal but flexible enough to tolerate a wide range of variations: simple plots, complex plots, parallel plots, epic plots, Russian doll plots (that is, recursively embedded stories), dramatic plots, and so on. It is on the level of these variations, as well as on the level of thematic content, that narrative is affected by historical, cultural, and medial factors.

the above definition not only provides criteria for determining a text's degree of narrativity,[4] it also suggests a basis for a semantic typology of narrative texts. While degree of narrativity depends on how many of the conditions are fulfilled, typology depends on the relative prominence of the four dimensions. The Grand Narratives of Lyotard breach the top condition, because they do not concern individuals and do not create a concrete world, while postmodern novels are often low in narrativity because they do not allow readers to reconstruct the network of mental representations that motivates the actions of characters and binds the events into an intelligible and determinate sequence. Through a structure that I call "proliferating narrativity" (Ryan 1992, 373–74), contemporary fiction (especially magical realism and postcolonial novels) may also shift condition (6) from the macro to the micro level, becoming a collection of little stories loosely connected through common participants.

Among narratives that fully satisfy all the conditions, some emphasize the spatial dimension, others the temporal, and still others the mental. With their detailed construction of an imaginary world, science fiction and fantasy locate interest in the spatial dimension, and these genres often treat the plot as a mere discovery path across the fictional world.[5] The demand for action and changes of state that make up the temporal dimension is the dominant feature of thrillers and adventure stories, while the mental dimension, by insisting on the motivations and emotions of characters, rules over tragedy, sentimental romances, detective stories, comedies of errors, and, in the nonfictional domain, narratives of personal experience. In contrast to modernist novels that represent the mind for its own sake, these narrative genres evoke mental processes as a way to explain the behavior of characters.

The definition proposed above presents narrative as a type of text able to evoke a certain type of image in the mind of a cognizing subject. But it does not take a text to inspire the construction of such an image: we may construe stories as a response to life itself, and keep them in memory until we get an opportunity to tell them to an audience. According to cognitive scientists (for instance, Schank and Abelson), most if not all memories are indeed stored in the form of stories. I am not saying that life "is" a narrative, but it can in certain circumstances suggest a quality that we may call "narrativity." The property of "being a narrative" can be predicated of any semiotic object produced with the intent to evoke a story to the mind of the audience. To be more precise, it is the receiver's recognition of this intent that leads to the judgment: this text is a narrative, though we can never be sure that sender and receiver have the same story in mind. "Having narrativity," on the other hand, means being able to evoke such a script, whether or not there is a text, and if there is one, whether or not the author intended to convey a specific story. The concept of "having narrativity," as opposed to "being a narrative," offers a fitting description of the particular narrative quality of music, which remains a theoretical enigma to many scholars (see Nattiez 1990).

My endorsement of a cognitively rather than verbally based definition of narrative should not be taken as an unconditional adherence to a position that has recently taken cognitive science, the social sciences, and the humanities by storm. This position proclaims the fundamentally narrative nature of thought, knowledge and memory, and it equates our never-ending efforts to make sense of the world and of our lives with a process of "emplotting" or "storying."[6] Without denying that storytelling (to oneself or to others) is an efficient way to make life and the world more intelligible, and that the formation of narrative scripts plays an important role in mental life, I believe that there are sense-making operations that do not take narrative form: capturing the laws of physics through an equation such as $E = MC^2$ fails, for instance, the top conditions of my definition, since it produces a timeless law rather than a historical scenario involving particular individuals and one-of-a-kind transformations. Sense making can also result from the drawing of analogies and contrasts between phenomena, rather than from the chronological and causal ordering of individual events.[7] The mental construct that I regard as constitutive of narrative admittedly puts into play cognitive processes that we also use in everyday life, such as focusing thought on certain objects cut out from the flux of perception, a process that also enables us to distinguish discrete states and events; inferring causal relations between these states and events; thinking of events as situated in time; and reconstructing the content of other peoples' minds as an explanation of their behavior. We resort to these mental operations when we drive a nail with a hammer (acting on the basis of inferred causal relations), when we plan our schedules (temporal ordering), when we make grocery lists (focusing on certain items selected from the

wide range of available products), and when we participate in social interaction, especially conversation (reading other people's minds). The activation of one or the other of these cognitive processes is not sufficient to produce narratives, because they can operate independently of each other, as my examples suggest. It is only when they all come together and form a reasonably stable mental image that they generate representations that fulfill all the conditions of my definition. Narratives are more than temporary drafts in the theater of the mind, more than transitory firings of neurons in the brain along individual pathways; they are solidified, conscious representations produced by the convergence of many different mental processes that operate both within and outside stories.

Narrative Modes

If narratology is to expand into a medium-free theory, the first step to be taken is to recognize other narrative modes than the standard way of evoking narrative scripts: telling somebody else that something happened. I do not take this term of mode in the traditional narratological sense defined by Genette (1972) (who uses it as a rather vague umbrella term for concepts such as frequency, direct and indirect discourse, perspective, and focalization), but in a personal sense, to mean a distinct way to bring to mind the cognitive construct that defines narrativity. The best way to explain this concept of modality is through a list of concrete examples. This list, which I regard as open-ended, is organized for convenience's sake into ten binary pairs and one triple. In each group the left-hand term can be regarded as the unmarked case, because the texts that present this feature will be much more widely accepted as narrative than the texts that implement the right-hand category. The conjunction of all the left-side categories yields the prototypical narrative situation, while the actualization of one (or more) of the right-hand categories leads to marginal forms. If the set of all narratives were the bird family, the left-hand elements would correspond to robins and nightingales, its most exemplary members, and the right-hand terms to penguins, kiwis, and ostriches.[8] The terms of the oppositions described below are not freely combinable and I do not claim that my "system" can generate $2^{10}*3$ types of narrative. Some modes presuppose or exclude others, and the list could be organized differently.

External/Internal. In the external mode, narrative meaning is encoded in material signs; it is textualized. In the internal mode, it does not involve a textualization: we can tell ourselves stories in the privacy of our minds (see Jahn 2003).

Fictional/Nonfictional. Of all the pairs of modes listed here, this is the most widely recognized and the most extensively theorized, but also the hardest to define. I will not discuss it here, since it forms the subject matter of chapter 2. I do not personally regard fiction as a more prototypical form of narrative than nonfiction, but some scholars do (Wolf, Fludernik, Jannidis), presumably because of the greater variety of its discourse. Moreover, as we will see in chapter 2, some scholars deny the possibility of a nonfictional form of narration.

Representational/Simulative. This distinction is based on the idea that a given process may be actualized in many different ways, or that a given action may have many different consequences depending on the global state of the world. A representation is an image of one of these possibilities, while a simulation is a productive engine that generates many different courses of events through a combination of fixed and variable parameters. A narrative mode specific to digital media, simulation is found in story-generating programs and in computer games. (Simulation will be further discussed in chapter 8.)[9]

Diegetic/Mimetic. An expansion of the representational category of the preceding pair, this distinction goes back to Plato. A diegetic narration is the verbal storytelling act of a narrator. As the definition indicates, diegetic narration presupposes language, either oral or written; it is therefore the mode typical of the novel and of oral storytelling. A mimetic narration is an act of showing, a visual or acoustic display. In forming a narrative interpretation the recipient works under the guidance of an authorial consciousness, but there is no narratorial figure. Mimetic narration is exemplified by all the dramatic arts: movies, theater, dance, and the opera. But each of these two modes can intrude into a narration dominated by the other. The dialogues of a novel are islands of mimetic narration, since in direct quote the voice of the narrator disappears behind the voice of the characters; and conversely, the phenomenon of voiced-over narration in cinema reintroduces a diegetic element in a basically mimetic medium.

Autotelic/Utilitarian. In the autotelic mode, the story is displayed for its own sake; in the utilitarian mode, it is subordinated

to another goal, such as making a point in a speech or sermon, explaining a situation through an example, or motivating people to adopt certain behaviors.

Autonomous/Illustrative. In the autonomous mode, the text transmits a story that is new to the receiver; this means that the logical armature of the story must be retrievable from the text. In the illustrative mode, the text retells and completes a story, relying on the receiver's previous knowledge of the plot. The illustrative mode is typical of pictorial narratives, for instance, medieval paintings of biblical scenes. Halfway between these two poles are texts that offer a new, significantly altered version of a familiar plot, such as a modern retelling of a classical myth.

Scripted/Emergent. In the scripted mode story and discourse are entirely determined by a permanently inscribed text. Examples include both print narratives and dramatic performance relying on memorized text. In the emergent mode, discourse, and at least some aspects of story, are created live through improvisation by the narrator (oral storytelling), by the actors (commedia dell'arte), by the recipient (see participatory), or through computer programming (see simulation).

Receptive/Participatory. In the receptive mode the recipient plays no active role in the events presented by the narrative nor in their presentation: she merely receives the account of a narrative action, imagining herself as an external witness. In the participatory mode (a subcategory of emergent), the performance of the recipient actualizes the narrative and completes it on the level of either discourse or story. In discourse-level participation (hypertext fiction), the recipient-participant determines the order of presentation of the text, while in story-level participation (pencil and paper role-playing games *[Dungeons and Dragons]*, interactive drama, and computer games) she impersonates an active character who influences the evolution of the storyworld.

Determinate/Indeterminate. As the image of a world that undergoes metamorphoses, a story traces an arc, or a trajectory, that traverses many points in time. In the determinate mode the text specifies a sufficient number of points on the narrative arc to project a reasonably definite script. In the indeterminate mode, only one or two points are specified, and it is up to the interpreter to imagine one (or more) of the virtual curves that traverse these coordinates. The indeterminate mode is typical of narrative paintings that tell

original stories through the representation of what Lessing calls a pregnant moment. The pregnant moment opens a small temporal window that lets the spectator imagine what immediately preceded and what will immediately follow the represented scene. But a full-blown story normally covers an extended stretch of time, and every spectator will probably imagine the remote past and the remote future in a different way.

Retrospective/Simultaneous/Prospective. In the retrospective mode, narrative recounts past events; in the simultaneous mode (TV and radio commentaries of live broadcasts), it recounts events almost as they happen; in the prospective (prophecies and political speeches), it focuses on future events. Setting events in what is from our historical point of view the future does not necessarily result in a prospective narrative: science fiction stories are usually told in the retrospective mode.

Literal/Metaphorical. What constitutes a literal or metaphorical narration depends on the particular definition given to narrative. While literal narration fully satisfies the definition, the metaphorical brand uses only some of its features. The degree of metaphoricity of a narrative thus depends on how many features are retained, and on how important they are to the definition. The great advantage of recognizing a metaphorical mode is that it enables narratology to acknowledge many of the contemporary extensions of the term "narrative" without sacrificing the precision of its core definition.

Here are some examples of what I consider metaphorical types of narrative. If we define narrative as the representation of a world populated by individuated characters, and if characters are intelligent agents, the following relaxations of the definitions should be regarded as metaphorical: scenarios about collective entities rather than individuals (for example, the "Grand Narratives" of Lyotard, as well as their heirs, the "narratives of class, gender and race" of contemporary cultural studies); narratives about entities deprived of consciousness (for example, Richard Dawkins's exposition of biology as the story of "selfish genes"), and dramatizations that attribute agency to abstract concepts (Hegel's "ruses of Reason").

If we want to stretch the metaphor to its limits, we can apply it to art forms deprived of semantic content, such as music and architecture. In the case of music, the metaphor can be invoked to analyze the structure of the work in terms of narrative effects or narrative

functions. Narrative terminology is indeed common in music theory: relations between chords are described as exposition, complication, and resolution. Given a specific exposition and complication, only certain chords will provide a satisfactory resolution. In this metaphorical interpretation, all music becomes narrative, while if we use an illustrative interpretation, narrativity is a feature that occurs in only some compositions—those that allude to a narrative through their title, such as the *Don Quixote Suite,* by Telemann, or the *Sorcerer's Apprentice,* by Paul Dukas. In the case of architecture, a metaphorical interpretation would draw an analogy between the temporality of plot and the experience of walking through a building. In a narratively conceived architecture, the visitor's discovery tour is plotted as a meaningful succession of events. This occurs in Baroque churches, where the visitor's tour is supposed to reenact the life of Christ.

Some of the modes listed above have strong affinities for certain media, while others can appear in several physical supports, but no mode is totally medium-independent. For instance, the distinction fictional-nonfictional appears in written and oral language, film, and television, but it is questionable in other media, as we will see in chapter 2. The diegetic mode presupposes language, illustrative occurs mainly in visual media, and the participatory mode is most common in digital environments, though not entirely limited to them. It is precisely this dependency of certain modes on certain media that makes the concept useful for transmedial narratology.

What Are Media?

The concept of medium is no less problematic than the concept of narrative. As Joshua Meyerowitz observes, "it is a glaring problem for media studies" that "we have no common understanding of what the subject matter of the field is" (1993, 55). This may seem a strange problem for the layman: don't we all instinctively know what media are? And yet, if we ask specialists of different disciplines to propose a list of media, we will receive a bewildering variety of answers. A sociologist or cultural critic will answer TV, radio, cinema, the Internet. An art critic may list music, painting, sculpture, literature, drama, the opera, photography, architecture. An artist's list would begin with clay, bronze, oil, watercolor, fabrics, and it may end with exotic items used in so-called mixed-media works, such as grasses, feathers, and beer can tabs. An information theorist or historian of writing will think of sound waves, papyrus scrolls, codex books, embossed surfaces (for Braille texts), and silicon chips. A philosopher of the phenomenologist school would divide media into visual, aural, verbal, and perhaps tactile, gustatory, and olfactory. In media theory, as in other fields, what constitutes an object of investigation depends on the purpose of the investigator.

These various answers reflect the ambiguity of the term. The entry for "medium" in *Merriam Webster's Collegiate Dictionary* (11th ed., 2003) includes, among other meanings, these two definitions: (1) a channel or system of communication, information, or entertainment; (2) material or technical means of artistic expression. Type 1 regards media as *conduits,* or methods of transmitting information; and type 2 regards them as *languages.* (I am borrowing these terms of comparison from Joshua Meyerowitz.)[10] Media of type 1 include TV, radio, the Internet, the gramophone, the telephone—all distinct types of technologies—as well as cultural channels, such as books and newspapers. Media of type 2 would be language, sound, image, or more narrowly, paper, bronze, or the human body.

In the conduit, or transmissive conception of medium represented by type 1, ready-made messages are encoded in a particular way, sent over the channel, and decoded on the other end. Before they are encoded in the mode specific to the medium in sense 1, some of these messages are realized through a medium in sense 2. A painting must be done in oil before it can be digitized and sent over the Internet. A musical composition must be performed on instruments in order to be recorded and played on a gramophone. Medium in sense 1 thus involves the translation of objects supported by media in sense 2 into a secondary code.

Some media theorists (Ong 1982, 176) have objected to the transmissive conception of medium, arguing that it reduces them to hollow pipelines, through which information passes without being affected by the shape of the pipe. It is almost an axiom of contemporary media theory that the materiality of the medium—what we may call its affordances, or possibilities—matters for the type of meanings that can be encoded. On the other hand, if we regard meaning as inextricable from its medial support, medium-free definitions of narrative become untenable and we fall back into the doctrine of radical medial relativism. This doctrine, as we have seen, makes it illegitimate to compare messages embodied in different media and to view them as manifestations of a common

The second preliminary issue concerns the distinctive properties of digital media. To make a list of these properties does not mean that digital media form a unified field and that each of their idiosyncratic features is available to every application. On the contrary, there are several genres within digital textuality, and different genres exploit different properties. I would like to single out the following five properties of digital media as the most fundamental.[1] These properties affect narrativity in either a positive or a negative way.

1. Reactive and interactive nature. By this I mean the ability of digital media to respond to changing conditions. *Reactivity* refers to responses to changes in the environment or to nonintentional user actions; *interactivity* is a response to a deliberate user action.
2. Multiple sensory and semiotic channels, or what we may call "multimedia capabilities," if we are not afraid of the apparent paradox of talking about multimedia media.
3. Networking capabilities. Digital media connect machines and people across space and bring them together in virtual environments. This opens the possibility of multi-user systems and live ("real-time") as well as delayed communication.
4. Volatile signs. Computer memory is made of bits whose value can switch back and forth between positive and negative. Unlike books or paintings, digital texts can be refreshed and rewritten, without having to throw away the material support. This property explains the unparalleled fluidity and dynamic nature of digital images.
5. Modularity. Because the computer makes it so easy to reproduce data, digital works tend to be composed of many autonomous objects. These objects can be used in many different contexts and combinations, and undergo various transformations, during the run of the work.

While the full expressive power of digital media cannot be described without mentioning all of these properties, I believe that the first one, interactivity, is the truly distinctive, and consequently fundamental, one. A novel can be digitized, made available on the Internet (property 3), and even daily updated (property 4) while remaining a traditional novel, as the recent publishing experiment by Stephen King has shown. Similarly, cinema offers multiple channels (property 2) and fluid images that replace one another easily on the screen (property 4);[2] moreover, a movie can be shown on the Internet (property 3) without significant consequence for its narrative potential. But, when interactivity is added to the text or the movie, its ability to tell stories, and the stories it can tell, are deeply affected.

The third issue to be addressed before we can begin our discussion is the refinement of the concept of interactivity. This essay will be based on a typology of user participation in digital media that involves two dichotomies, internal versus external involvement and exploratory versus ontological involvement.[3]

Internal/External involvement
In the internal mode users project themselves as members of a virtual (or fictional) world, either by identifying with an avatar or by apprehending the virtual world from a first-person perspective. In the external mode readers situate themselves outside the virtual world. They either play the role of a god who controls the fictional world from above, or they conceptualize their activity as navigating a database. This opposition is not strictly binary: the position of the user may be more or less internal or external, or the same text may give rise to different imaginative acts. Some users will spontaneously situate themselves inside the textual world; others prefer a distanced point of view.

Exploratory/Ontological involvement
In the exploratory mode users are free to move around the database, but this activity does not make history, nor does it alter the plot; users have no impact on the destiny of the virtual world. In the ontological mode, by contrast, the decisions of the user send the history of the virtual world on different forking paths. These decisions are ontological in the sense that they determine which possible world, and consequently which story, will develop from the situation in which the choice presents itself. This opposition is much more binary than the preceding one, though a hybrid case will also be discussed here.

The cross-classification of these two dichotomies yields four types of user participation in the text: internal/exploratory, internal/ontological, external/exploratory, and external/ontological. I do not claim that my typology exhausts the field of possibilities; for instance, interactivity can be described as either selective (clicking on a link) or productive (participating in a narrative action through dialogue and gestures). Nor do I wish to say that every text fits neatly into one of these classes: sometimes the user's role changes in the run of the program; sometimes the user's mode of participation can be viewed in two different ways. I have chosen these four categories because they provide a convenient frame for the presentation of the various modes

of interactive narrativity. Here I will discuss five digital genres: hypertext, text-based virtual environments, interactive drama, computer games, and live Internet image transmission through Webcams.

Hypertext

By now the idea of hypertext should be quite familiar to students of literature: hypertexts are networks of textual fragments, called "lexia" or "textrons," connected by links. Readers move through the text by clicking on buttons, and, since most fragments contain many buttons, readers have a choice of many different itineraries. The significance of this multiplicity has been an object of endless theorizing. Of special relevance to our topic is the claim that, since every reading follows a different path, hypertext is capable of endless self-regeneration. I call this interpretation the Alephic conception of hypertext, by analogy with "The Aleph," the short story by Jorge Luis Borges in which the scrutiny of a cabalistic symbol enables the experiencer to contemplate the whole of history and of reality, down to its most minute details. The Aleph is a small, bound object that expands into an infinity of spectacles, and the experiencer could therefore devote a lifetime to its contemplation. Similarly, hypertext has been conceived as a matrix that expands into a multitude of texts, as readers unravel new strings of signs from its finite database of discrete lexia.

If we equate these strings of signs with "narrative," hypertext becomes a machine for the production of stories, just as the grammar of a language is a machine for the production of sentences. It is in these terms that Michael Joyce envisions the novelty of hypertext with respect to print narrative: "Reordering requires a new text; every reading thus becomes a new text . . . Hypertext narratives become virtual storytellers" (193). Joyce's now classic hypertext novel *afternoon* allegorizes this idea of hypertext as a matrix of different stories by proposing several different versions of the fictional world. The common theme of all these variations is the narrator's witnessing of a car accident. In one version the accident is fatal, and the narrator's ex-wife and son are the victims. In another version the victims are strangers. In a third the accident is not serious. In a fourth the narrator himself causes the accident. Or everything could have been dreamed or hallucinated. For those who endorse the Alephic interpretation of hypertext, every reading session leads to different lexia, creates different semantic connections between them, and consequently constructs a different story around the theme of the accident.

As seductive as this conception appears—aren't we all enamoured with the idea of an open, constantly self-transforming work?—it cannot be taken literally. First, it is not so much because of the interactive nature of hypertext that *afternoon* proposes different versions of the same event but because Michael Joyce deliberately chose to include lexia with contradictory content in his database. He could have done the same thing in a print environment. There are indeed many postmodern novels that refuse to construct a solid actual world based on an authoritative version of facts. Second, the conception of hypertext as a story-generating machine puts questionable emphasis on linear sequence and the narrative significance of the link. If we take literally the claim that every traversal of the database determines a different story, readers who encounter three segments in the order A then B then C will construct a different story than readers who encounter the same segments in the order B then A then C. If readers could place the information given by each lexia wherever they wanted in a developing narrative pattern, it would not matter in which order they visit the lexia themselves, and the sequences A B C would yield the same story as B C A. Take the case of readers who first encounter a lexia telling them that a certain character is dead and later discover another lexia in which the same character is still alive. Readers have two choices. If linking and sequencing are narratively significant, they will assume that the character has been resurrected—an interpretation that presupposes a supernatural world that may clash with the semantics of the text as a whole. (There is nothing supernatural about the world of *afternoon,* for instance.) Alternatively, they may decide that the sequence established by the links does not represent causal and temporal order. They will then treat the lexia telling of the death as a prolepsis (flash-forward), and they will reconstruct the same story as readers who encounter the two fragments in the opposite order.

If narrativity is a mental representation constrained by logical principles, it is simply not possible to construct a coherent story out of every permutation of a set of textual fragments, because fragments are implicitly ordered by relations of presupposition, material causality, psychological motivation, and temporal sequence. It is only in hypertexts with a very simple map, such as the tree-shaped diagram that underlies the children's stories known as Choose Your Own Adventures, that narrative continuity can be maintained for every traversal. On a tree diagram different readings follow different branches, but on a given branch a lexia is always preceded and followed by the same lexia. This makes it easy for the author to control the progression of the reader and consequently to guarantee proper logical sequence. But the vast majority of literary hypertexts are based on more complex networks that make it possible for a given lexia to appear in different contexts. The

author may control the path of the reader out of a certain node, but after a few transitions the path becomes unpredictable.

In keeping with his well-known theory of readers as coauthors, George Landow puts the burden of filling in the logical gaps between fragments on readers' imaginations: "In a hypertext environment a lack of linearity does not destroy narrative. In fact, since readers always, but particularly in this environment, fabricate their own structures, sequences or meanings, they have surprisingly little trouble reading a story or reading for a story" (197). But it would take a mind with angelic—or, rather, post-human—powers to fit lexia in a narratively coherent pattern for every order of appearance. For merely human minds what hypertext offers is not a story-generating machine but something much closer to the narrative equivalent of a jigsaw puzzle: readers try to construct a narrative image from fragments that come to them in a more or less random order, by fitting each lexia into a global pattern that slowly takes shape in the mind. Just as we can work for a time on a puzzle, leave it, and come back to it later, readers of hypertext do not start a new story from scratch every time they open the program but, rather, construe a mental representation over many sessions, completing or amending the picture put together so far. It is by creating what Espen Aarseth has called a "game of narration" (94), a scrambled picture that readers try to put back together, that hypertext narrative takes advantage of the interactive properties of its medium. Out of new syntactic features—fragmentation and linking—hypertext thus creates a new type of discourse.

The role of readers in this game of narration can be described by the parameters of external and exploratory interactivity. Involvement is external, because readers are not cast as members of the textual world and because it takes a perspective akin to a god's-eye view to appreciate the design of the textual network. Readers regard the text more as a database to be searched than as a world in which to be immersed.[4] And, in spite of George Landow's theory of readers as coauthors, involvement is exploratory, rather than ontological, because readers' paths of navigation affect not the narrative events themselves but only the way in which the global narrative pattern (if there is one at all) emerges in the mind. Similarly, with a jigsaw puzzle the dynamics of the discovery differ for every player, but they do not affect the structure that is put together. Just as the jigsaw puzzle subordinates the image to the construction process, external/exploratory interactivity de-emphasizes the narrative itself in favor of the game of its discovery. Many scholars (for example, Davenport and Sloane) have indeed observed that hypertext is not a good medium for the creation of compelling plots that live from suspense and emotional participation in the fate of characters.

Thematically speaking, the external/exploratory interactivity of classical hypertext is better suited for self-referential fiction than for narrative worlds that hold the reader under their spell for the sake of what happens in them. It promotes a metafictional stance, at the expense of immersion in the fictional world. This explains in part why so many literary hypertexts offer a collage of literary theory and narrative fragments.[5]

In recent years, however, hypertext has taken a new direction that shifts its conceptualization from the model of the scrambled narrative to what Raine Koskimaa has called the model of the searchable archive. This new direction is tied to the improving multimedia capabilities of digital systems.[6] In the multimedia phase hypertext can return to more solid narrative structures, and to a more linear presentation, without reverting to the mode of signification of the standard novel, because interactivity can now take the form of moving from one medium to another, rather than jumping around a text. Here I must fundamentally disagree with Robert Coover, who thinks that the golden age of digital literature came to an end when hypertext ceased to be purely verbal. Hypertext can learn from the artist's book, pop-up children's books, activity books, advent's calendar, and art CD-ROMs to spread many surprises along the visitor's way. Visible or hidden links can be used to give the tactile pleasure of mousing over hot spots and of making something happen—the expansion of the textual world into a diversified sensory experience. Readers of these texts will be cast into the role of an investigator who digs into the history of the textual world by freely exploring a collection of documents. The type of topic and structure best suited to this idea of searching an archive will be collections of little stories, such as family sagas, narratives of cultural memory, local history (for instance, the communal story of a village) or biography. These subjects lend themselves particularly well to the relatively free browsing of hypertext because the story of a life or a community is not a dramatic narrative aimed at a climax but an episodic narrative made of many self-sufficient units that can be read in many orders.

Text-Based Virtual Environments (MOOs and MUDs)

A text-based virtual environment is a social meeting place accessible through a network. Users log on to the system and interact with one another under the mask of a fictional character. This character, known in the jargon as "avatar," is created by posting its description, just as a novelist creates characters through the performative value of fictional discourse. The same method is used by the builders of the system to create a permanent

setting, typically a large building with many rooms furnished with textually described objects. In both the building of the setting and the performance of identities, MOOs are largely dominated by fantastic themes.[7] When they are not used as platforms for serious business, they provide a forum for free flights of fancy, black humor, and surrealist incongruities. Most of the interaction that takes place on the MOOs consists of small talk and gestures, hardly the stuff of narrative, but this small talk easily develops into conversational storytelling:

> Carrot grins
> Carrot waves
> Turnip waves to Carrot
> Carrot says Hi
> Turnip says What's up
> Carrot says Want to hear a good joke :-;
> Turnip says
> Carrot tells joke

The joke told by Carrot to Turnip is a standard example of diegetic storytelling. It is told in writing but according to the real-time pressures and stylistic conventions of oral interaction: you have to be a fast typist as well as a fast mind to be a good performer on the MOOs. Even the gestures that traditionally accompany storytelling can be textually simulated. From a discourse point of view, this hybrid status between oral and written communication is the truly distinctive feature of MOO storytelling. When the users are sufficiently imaginative, however, MOO interaction rises to the level of a dramatically enacted narrative. For instance:

> Bek throws Panther a box, wrapped prettily. "Open it! I bought it just for you."
> Lilypad gets the box open and takes out a puppy.
> Lilypad (*to* Bek): She's a wonderful puppy . . . Where did you get her?
> Bek (*to* Lilypad): I found her in an old warehouse. I took her home and cleaned her up. I hope you like her. Here, I have a toy for her. (Adapted from Kolko 115)

MOO participants have been known to construct imaginary objects—here the puppy—and to build elaborate scenarios around these props. When this creative role playing actually takes place, MOOs become the stage of a collaboratively created narrative performance. Since the participants improvise this script for their own gratification, they are at the same time authors and spectators, actors and characters. On the pragmatic level the

singularity of the MOO experience can be described as an alternation between three different forms of interactivity:

- Ontological-external: creating a character or building a room by posting its description. (Out-of-character behavior)
- Ontological-internal: interacting with other users by performing actions or posting dialogue. (In-character behavior)
- Exploratory-internal: wandering around the MOO, visiting rooms, and looking at objects. (Neutral behavior)

Can we call MOOs a new form of narrative? The problem does not reside with the very obvious novelty of the platform but with the narrativity of the performance. MOOs readily offer two of the three basic elements of narrative: setting and characters. The question mark concerns the plot: as Elizabeth Reid has suggested, MOOs create a stage but not a script.[8] Most of the time MOO visitors are satisfied with small talk. It is up to the improvisational skills, willingness to pay roles, and cooperativeness of the participants to produce a dramatic trajectory retellable as a story.

Interactive Drama in VR Environments

While text-based virtual environments are multi-users platforms, virtual reality installations can only accommodate a limited number of participants. If the technology is ever perfected, VR will enable users to take their body into three-dimensional simulated worlds and to experience these worlds through most of their senses. In the wildest dreams of developers these simulated environments will support an interactive form of drama. According to Brenda Laurel, "The user of such systems [will be] like audience members who can march up onto a stage and become various characters by what they say and do in their roles" (16). Janet Murray conceives the future drama form on the model of the Holodeck of the popular TV show "Star Trek." The Holodeck is a kind of VR cave, in which the crew members of the starship *Enterprise* retreat for relaxation and entertainment. In this cave a computer runs a three-dimensional simulation of a fictional world, and visitors—let's call them "interactors"—become a character in a digital novel. The plot of this novel is generated live, through the interaction between human participants and computer-created, AI-operated virtual characters. In the example discussed by Murray, Kathryn Janeway, the female commander of the starship *Voyager,* sneaks into the Holodeck and becomes Lucy, the governess of the children in an aristocratic Victorian household. Lucy falls in love with the father of the children, Lord Burley, and they exchange

passionate kisses, but the very responsible Kathryn realizes that this love for a virtual human is detrimental to the fulfillment of her duties in the real world, and she eventually orders the computer to delete the character. Murray interprets this action as evidence that VR-based interactive drama can match both the entertainment and the educational value of literary narrative: "The Holodeck, like any literary experience, is potentially valuable in exactly this way. It provides a safe place in which to confront disturbing feelings we would otherwise suppress; it allows us to recognize our most threatening fantasies without becoming paralyzed by them" (25).

The viability of the concept of the Holodeck as a model of a digital narrative is questionable for both technological and algorithmic reasons: we don't have the hardware to produce truly lifelike three-dimensional virtual worlds, and we don't have the AI to produce complex characters.[9] The closest attempts so far to implement the Holodeck experience are the projects in interactive drama currently developed at Carnegie Mellon University, under the direction of Joseph Bates (until 1999) and Michael Mateas. These projects use a strongly Aristotelian script (following the curve prescribed by the Feytag triangle), and they are meant for a fifteen-minute visit of intense emotional involvement by a single human player (as Mateas calls the visitor). Anything longer would strain the system as much as the participant. Players impersonate a character and interact, mostly through dialogue, with AI-animated characters. The system allows a half-dozen plot variations, all triggered by the behavior of the player. After that many visits, the player will consequently feel that all the narrative possibilities are exhausted. Although the ultimate goal of developers is to stage the projects in three-dimensional VR environments with full-body immersion, at the present time the interface is a computer screen, a keyboard, and a mouse. (See Mateas and Stern for a technical description; and Ryan, chap. 10, for a narratological discussion.) Here is the plot of Mateas's current project.

> Grace and Trip are apparently a model couple, socially and financially successful, well-liked by all. Grace and Trip both know the player from work. Trip and the player are friends; Grace and the player have gotten to know each other only fairly recently. Shortly after arriving at their house for dinner, Grace confesses to the player that she has fallen in love with him. Throughout the rest of the evening, the player discovers that Grace and Trip's marriage is actually falling apart. Their marriage has been sour for years; deep differences, buried frustrations, and unspoken infidelities have killed their love for each other. How the veneer of their marriage cracks, what is revealed, and the final disposition of Grace and Trip's marriage, and Grace and Trip's relationship, depends on the actions of the player. (Mateas and Stern 2)

This plot evidently strives toward high emotional drama, but its feasibility is questionable: how could a lifelong relationship be resolved in the fifteen minutes allowed for the project? In *Who's Afraid of Virginia Woolf* Edward Albee needed no less than two hours to break down a marriage. It is admittedly the essence of dramatic art to make long-simmering problems reach a crisis and resolution in the limited time frame of the stage action. But it would be an extraordinary achievement to bring the marital problems of Grace and Trip to an outcome, and to do so in a believable manner, in a fraction of Albee's time.

The predominantly affective nature of the plots suggested by Murray and Mateas presents a serious emotional problem: what kind of gratification will experiencers receive from becoming a character in a drama or a story? The entertainment value of the experience depends on how interactors relate to their avatar: will they be like an actor playing a role, internally distanciated from their character and simulating emotions they do not really have, or will they experience their character in the first-person mode, actually feeling the love, hate, fears, and hopes that motivate the character's behavior? The destiny of most literary characters is so unpleasant that interactors would have to be out of their mind—literally and figuratively—to voluntarily experience it in the first person mode. If we derive aesthetic pleasure from the tragic fate of Anna Karenina, Hamlet, or Madame Bovary, if we cry for them and fully enjoy our tears (as well as theirs), it is because our participation in the plot is a compromise between the first-person and the third-person perspective. We simulate mentally the inner life of these characters, we transport ourselves in imagination into their mind, but we remain at the same time conscious of being external observers. Any attempt to turn empathy, which relies on self-conscious mental simulation, into first-person, genuinely felt emotion would in the vast majority of cases trespass the fragile boundary that separates pleasure from pain. I suspect, therefore, that the aesthetic gratification of players of Mateas's project will be less a matter of emotional involvement than a matter of curiosity about the cleverness of the system. It will take the full six or seven visits for players to appreciate the dramatic architecture of the project.

An even more serious problem with the idea of becoming a character in a novel or drama is the reconciliation of users' freedom of action with the

creation of an aesthetically enjoyable plot. A plot is a global design, imposed top down on the fictional world by a godlike author, while the actions of characters write the story of the fictional world from within this world itself. Characters live their life looking forward, while the author arranges their destinies with an eye on the global trajectory of the plot. How can interactors be coaxed into maintaining the plot on a proper aesthetic course while acting in the name of a fictional persona whose concern is survival in a material world, rather than living their life according to the demands of aesthetic teleology? Joseph Bates and his colleagues (Kelso and others) have argued that interactive drama is meant to be played, not to be spectated, and that we judge a plot in which we participate by different standards than a plot that we watch. This could mean that the criteria applying to interactive drama may not be as strict as those through which we judge literature and traditional drama. But the problem of how to script users' actions in VR environments and gently guide participants onto the path of aesthetic gratifications is far from being resolved.

I believe that both the emotional and the design problem of interactive drama can be minimized by abandoning the idea of building a full-fledged dramatic (that is, Aristotelian) plot around the persona of the interactor. Most dramatic plots feature the mind of their characters as the theater of uncontrollable passions, and their fate as a struggle against the blind forces of destiny. But, if we are going to enter a virtual world, it is to be agents and not patients. This means that only selected types of emotional experiences, and consequently selected types of participation, will lend themselves to the first-person perspective of interactive drama. Rather than becoming a character in a novel or a drama—and thereby losing their identity—interactors could play a counterpart of themselves in a foreign environment. If we consider the whole gamut of fictional characters, which ones would we rather emulate: (1) Hamlet, Emma Bovary, Gregor Samsa in *The Metamorphosis,* Oedipus, Anna Karenina, the betrayer Brutus in *Julius Ceasar;* or (2) the dragon-slaying hero of Russian fairy tales, Alice in Wonderland, Harry Potter, or Sherlock Holmes? As far as I am concerned, I would pick a character from list (b), which means a rather flat character whose contribution to the plot is not a matter of rich inner life and intense affective experience but, rather, a matter of exploring a world, performing actions, solving problems, competing against enemies, and, above all, dealing with interesting objects in a visually stimulating environment. This kind of involvement is much closer to playing a computer game than to living a Victorian novel or a Shakespearean drama. On the other hand, if the authors of the future insist on staging the equivalent of high literary plots

in VR environments, interactors will be better off playing the marginal role of observer. They will exercise their agency by navigating the virtual world and by selecting their point of view on the events that unfold in it, rather than by being existentially entangled in these events. I see, therefore, two possibilities for interactive drama in VR environments: ontological/internal involvement when the plot focuses on adventure and problem solving; or exploratory/internal participation when the plot focuses on interpersonal relations and deeply affective experiences.

Computer Games

The third genre, computer games, may be the least adventurous in the domain of narrative theme and structure, but, as millions of game addicts have proven, it is the most successful in terms of turning users into characters. The secret to the narrative success of games lies in their ability to exploit the most fundamental of the forces that move a plot forward: the solving of problems. The player pursues the goal specified by the game by performing a series of moves that determine the destiny of the gameworld. This destiny is created dramatically, by being enacted, rather than diegetically, by being narrated. But, in contrast to standard drama, the enactment is autotelic, rather than being directed at an observer: performing actions is the point of the game and the main source of the player's pleasure. Players are usually too deeply absorbed in their task to reflect on the plot that they write through her actions, but, when people describe their sessions with computer games, their reports typically take the form of a story. Consider, for instance, this review by Peter Olafson of the game Combat Mission, which simulates the German campaign in Russia during World War II: "My two panzer IVG tanks got lucky. Approaching the crossroads, they cleared a rise and caught two Sherman tanks out of position, one obstructing the aim of the other. Concentrating their fire, they quickly took out the Allied units and the surviving crews abandoned the flaming hulks and retreated into the woods nearby" (*New York Times,* October 5, 2000). Many people will rightly argue that computer games are played for the sake of solving problems and defeating opponents, of refining strategic skills and of participating in online communities, and not for the purpose of creating a trace that reads like a story. In contrast to the genres discussed so far (with the possible exception of social MOOs), the narrativity of games is not an end in itself but a means toward a goal.[10] The most sophisticated games do not need to dress up in narrative garb to attract players onto their field. In classic games such as Go, Tetris, Chess, and Pac-Man users

manipulate wholly or partly abstract objects, and the game lives from the strategic cleverness of its design, rather than from the imaginative impact of its world. The purpose of narrative scenarios is to make up for the absence of an original, truly superior design by providing what Kendall Walton has called "a prop in a game of make-believe." Scenarios create diversity on the level of the imaginative experience, when rules fail to create sufficient diversity or novelty on the level of strategy.

The importance of the narrative background varies with the genre of the game. There is in principle no reason why a complex fictional plot could not be presented in game form and constitute the focus of player/readers' interest. Players would be solving problems or accomplishing certain tasks to be allowed to get to the next episode. Experience has shown, however, that the formula is not very successful. When readers are really interested in "what happens next," they do not want to find unnecessary obstacles thrown in their way. The narrative element of computer games is therefore typically subordinated to the playing action. Plot is the most visible, and elaborate, in the so-called RPG (role-playing) games to which I allude in the MOO section. In these games participants spend a lot of time creating and customizing their own character, they encounter many "NPGS" (nonplaying characters) during their wandering in the fictional world, and the games present many "cut-scenes," that is, lengthy movie clips. But the development of an elaborate plot cuts into the player action time, since movie clips and the dialogue of nonplaying characters can only be spectated. In the pure action games plot is merely a pretext for fast-paced action (having something to do all the time seems to be a prerequisite for success), and players quickly forget, in the fire of combat, the narrative purpose of their moves. Since the narrative scenario of action games is dictated by strategic design and since design types are limited, action games offer thematic variations of the same master plots: rescue the princess from the dragon; save the earth from evil aliens; disarm terrorists or be a terrorist yourself. It is indeed an urgent problem in the game industry to gain larger audiences by developing new narrative schemes.

Computer games represent several distinct genres, and the issue of narrative configuration and mode of participation must be treated separately for each of them. Let me briefly discuss the three principal types.

Adventure Games

The best-known representatives of adventure games are the so-called first-person shooters, such as Doom, Quake, and Half-Life. Adventure games illustrate the case of internal and ontological participation. Players operate

a character in the fictional world, and their playing skills determine the fate of their avatar. The interaction between users and the fictional world produces a new life for the character, and consequently a new life story, for every run of the system. The preferred narrative structure of the adventure game is the archetypal plot of the quest of the hero, as described by Vladimir Propp and Joseph Campbell. As Torben Grodal has observed, these games stretch their plot endlessly in time through the piling up of levels, episodes, and action cycles with similar structures. Because of their repetitive nature, the narrative scripts of typical adventure games would never sustain interest in a nonparticipatory environment, but in this case repetitiveness is an asset, since it is by performing the same actions over and over again that players acquire the physical skills necessary to excel at the game.

Repetition, in its modular form, is also the adventure game's solution to the conflict between user freedom and narrative design. It is because users' choices are quite limited in every situation and because every opportunity for action forms a relatively self-contained episode that games maintain the plot on the proper trajectory. In a shooting game, for instance, the choices of players consist of the directions in which to move, of deciding whether to shoot or to flee when an enemy appears, and, in the former case, of selecting and aiming weapons. The only memory needed by the system in computing these choices is keeping track of the resources available to players: how many weapons, how many soldiers, are left? In the complex plots of novels, by contrast, the options of characters at every decision point are both much richer and much more tightly constrained—richer because their range is that of life itself but also more constrained because the future is produced by the past and because every life intersects with, and is influenced by, multiple other destiny lines.

Simulation Games

The classics of simulation games are Simcity, Civilization, Caesar, Babyz, and The Sims. Here participation is ontological and external. Users are cast as a powerful but not quite omnipotent god who holds the strings of the members of a complex and dynamic system, such as a city, an empire, or a human group. The elements of the system react to players' decisions according to built-in behaviors specified by artificial intelligence algorithms. Through the manipulation of individual objects players write the history of a collective entity. The true hero of the story has no consciousness of its own: it is just the sum of multiple microprocesses. The purpose of players' actions is to maintain the system in a state of relative

equilibrium and to avoid steering the fictional world toward disaster, but the number of variables is too large for players to anticipate all possibilities. The computer complicates matters by throwing in random events. Players cannot win, since the fictional world is in perpetual evolution, but they derive satisfaction from competent management and from observing the relatively unpredictable behavior of the system.

While the operation of a simulation system requires a godlike position of power, many of the games mentioned here try to increase dramatic interest by casting users as a member of the fictional world. In Caesar, for instance, users are the ruler of the Roman Empire; in Simcity, the mayor of the city. The emperor or the mayor do not exist in the same space and time as their subjects. They rule the system from above, as the god's-eye perspective of the graphic display indicates, and they do not operate in a simulacrum of real time, since they have all the time in the world to make their decisions. All these features categorize them as external interactors. But, insofar as the personal fate of these characters is at stake in the way they govern, they are also internal participants. The mayor will be voted out of office if his administration of the city does not please his constituents, and Caesar will be dethroned if the Barbarians invade his empire. This combination of features places the games in question halfway between external and internal participation.

Mystery Games

Mystery games foreground what Roland Barthes has called the "hermeneutic code": the goal of the player is to solve an enigma. This genre allows greater narrative sophistication than the others because it connects two narrative levels: one constituted by actions of users, as they wander through the fictional world in search for clues, and the other by the story to be reconstructed. Since the story of this second level is independent of the actions of users, it can be as fully controlled by the author/designer as the plot of a novel. This genre illustrates the case of internal/exploratory participation. But the game architecture may occasionally blur the distinction between ontological and exploratory involvement. Imagine a game in which users receive the mission of investigating the past. Imagine further that, depending on the actions users take, one of two possible pasts is implemented, while the other branch is relegated to the realm of the counterfactual. Unbeknownst to them, users have written the past history of the fictional world. Something of that order happens in the classic game Myst. Players must decipher the events that led to the imprisonment of two evil brothers and their father, the good wizard Atrus (Murray 140–41). They do so by retrieving the pages of a book that tells the story of the fictional world. Depending on how they play the game, one of two endings takes place: in one ending players free Atrus; in another they free one of the evil brothers, who quickly imprisons the player. The narrative of the past thus extends into a player's present, and players determine the destiny of the fictional world without being aware of the ontological consequences of their actions.

Webcams

A narrative phenomenon that takes unique advantage of properties 3 (networking) and 4 (volatile signs) is the live recording of the evolution of a miniature world through a Web camera. Aimed at a particular setting, Webcams capture images at regular intervals and post them on the Internet for everybody to see. The most successful of these shows, needless to say, are those that focus on potential sites of sexual activities, such as the Webcams associated with Reality TV ("Big Brother," "Loft Story"), but truly dedicated digital voyeurs seem to find rewards in much less exotic subject matters, such as the utterly ordinary daily life of the family of a California hacker displayed on *www.nerdman.com.* There are even Webcams that show corn growing in Iowa.

No matter how banal their capture, however, Webcams provide a brand new twist on the idea of narrativity—if we loosen the concept to mean an episodic series of events featuring a specific group of individuals. Webcams do not tell stories, since all they do is place a location under surveillance, but they provide a constant stream of potentially narrative material. Their capture is the visual equivalent of what Hayden White calls a chronicle: a chronological list of events that presents neither the closure nor the causality nor the formal organization of a plot. It is up to the viewer to construct a story out of this material. The output of Webcams is not meant for lengthy viewings but for quick visits, known in the jargon as "grabs."[11] By studying the habits of the creatures under surveillance, clever cybervoyeurs will quickly learn when to check the Web site to catch the most interesting action. In the Nerdman game, for instance, players "score," in their own mind, by spotting the ghosts that occasionally traverse the screen. The biggest reward is to meet a human being, but in this dramatically impoverished environment—as in minimal art—the smallest change of state becomes a narrative event: a shadow stroking a linoleum floor, a car leaving the office parking lot, or a change of pattern in the sand of the cat box. Just as novelists cull the dramatic highlights from the continuous fabric

of their characters' lives, viewers sample the steady output of Webcams in the hope of catching the truly exciting episodes—the moments when memorable events "walk," so to speak, into the camera's field of vision. While checking is spotty, the lives we imagine from our peeks into the system are continuous and full; the members of the world facing the camera may not always be visible, but they are always, in some sense, available, since we can always visit their living space and look at the traces of their presence. The Webcam narrative experience can be pragmatically described as running in real time and customized by users grabbing images from an archive of transitory materials. Its interactivity is exploratory and external, since users look in from the outside and do not control the fate of the denizens of the fishbowl.

Conclusion

If we opt for a universalist conception of narrative and if we think of narrative in terms of semantic requirements, the answer to the question that forms the title of this essay is purely rhetorical: digital media have no more impact on the cognitive model through which we filter texts and make sense of human action than the experiments of postmodern fiction. The texts supported by digital media may satisfy to various degrees the universal cognitive model, or they may produce creative alternatives to a narrative experience, but they do not and cannot change the basic conditions of narrativity.

But there is more to narrative theory than the formulation of basic conditions. A complete grammar of language comprises three elements: semantics, syntax, and pragmatics. In narrative theory semantics becomes the study of plot, or story; syntax becomes the study of discourse, or narrative techniques; and pragmatics becomes the study of the uses of storytelling and of the mode of participation of human agents in the narrative performance. Digital media affect narrative in three ways. (See table 12.1 for a summary.)

On the pragmatic level they offer new modes of user involvement and new things to do with narrative: exchange stories in real time; impersonate a character; participate in the collective creation of a story; and explore a world in the pursuit of a story. (See the columns labeled "type of interactivity" and "user role" in table 12.1.) They also attribute various degrees of prominence to narrative in the total communicative event (see the last column in the table).

On the discourse level they produce new ways to present stories, which

Genre/Properties* Exploited*	Narrative Mode	Resources and Techniques	Themes and Structures	Mode of User Involvement	User Role	Prominence of Narrative
Hypertext 1 (2) 4 5	Diegetic narration (telling)	Fragmented display; chunking and linking	Metafictional narrative Archival narrative	External Exploratory	1. Putting scrambled story back together 2. Searching archive	Maintaining logical coherence in multilinear environment	Central, but can be linked to nonnarrative texts as part of a collage
Text-based virtual reality (MOOs) 1 3 4 5	Enactment through performative statements Dialogue Diegetic storytelling	Objects with internal behaviors Navigable space Written orality	Personal relationships Fantastic themes	Internal or external Exploratory or ontological	Playing roles Exploring world and interacting with its members	Creating guiding script	Intermittent (dramatic action and storytelling alternate with small talk)
Interactive Drama 1 2 4 5	Enactment through relatively free dialogue and gestures	3D panoramic display Presence of body in virtual world Navigable space	*Attempted:* Aristotelian plots *Recommended:* Fantastic themes Exploration Episodic narrative	Internal Ontological or exploratory	User as coauthor, character, actor, and beneficiary of performance	Creating guiding script that allows user participation while maintaining narrative logic and form	Central
Computer Games 1 2 (3) 4 5	Enactment through actions defined by the system	Navigable space Objects with internal behavior	Quest Evolution of complex entity Mystery stories	All combinations except for external/ exploratory	Performing specific task	Lack of variety of plots Providing alternatives to violent themes	Instrumental •
Webcams 1 3 4	Showing	Live, chronological presentation	Everyday life Sexual activities	External Exploratory	Reader as voyeur "Grabbing" highlights	Too little narrative action	Intermittent (Many dead moments)

*Numbers given to properties refer to the list in the text (page 338).

necessitate new interpretive strategies on the part of users. For instance, the "chunking-linking" technique of hypertext, as Hayles calls it, leads to the jigsaw puzzle mode of reading. (See the column labeled "discourse/techniques.")

On the semantic level, finally, the impact of digitality on narrative is not a matter of developing a new logic but, rather, a matter of finding the right fit between the medium and the form and substance of the narrative content. Each medium has particular affinities for certain themes and certain types of plot: you cannot tell the same type of story on the stage and in writing, during conversation and in a thousand-page novel, in a two-hour movie and in a TV serial that runs for many years. The most urgent of the issues that faces developers of new media narrative is to find what themes and what kinds of plots take proper advantage of the built-in properties of the medium. The fourth column of the table, themes and structures, proposes the beginning of an answer to this question. As my survey has shown, combining the inherent linearity of narrative structures with interactive protocols is not an easy thing to do, but the task will be much less daunting if we remember that there is no need for digital narrative to emulate Victorian novels or Shakespearian drama.

If we look back at the history of narrative, we can see it has survived the transition from orality to writing, from manuscript to print, from book to multimedia, and from the stage to moving pictures. Each of these technological innovations has liberated new narrative energies and exploited new possibilities. Given its well-demonstrated resiliency, narrative should easily weather the digital revolution. But I may be asking the wrong question. The survival of narrative does not depend on its ability to adapt itself to new media; narrative has been around so long that it has little to fear from computers. Rather, it is the future of new media as a form of entertainment that depends on their ability to develop their own forms of narrativity.

Notes

1. Many theorists of digital media have proposed lists of distinctive properties, and each of them comes up with a different list. But the different labels often cover related ideas. Janet Murray lists, for instance, the "four essential properties of digital environments" as being (1) procedural (that is, being operated by computer code); (2) participatory (my "interactive"); (3) spatial (but why single out spatiality and omit temporality?); and (4) encyclopedic (71–90). Lev Manovich lists: (1) numerical representation; (2) modularity (a category I borrow directly from him); (3) automation (Murray's "procedural"); (4) variability (my "volatility"); and (5) transcoding (the technical property responsible for my "multiplicity of channels")

(27–48). Which properties are considered essential depends on the purpose of the writer as well as on the criteria used in the selection: should these lists be restricted to properties unique to digital media, or should they include features that these media implement particularly efficiently but share with other media (for example, Murray's spatiality and encyclopedic scope); should they be concerned with aspects of technological implementation hidden from the user (for example, numerical representation); or should they limit themselves to openly displayed features? In my own list I favor features that have an impact on narrativity; that are either unique to digital media or taken by them to a new level; and that the user can perceive directly.

2. This holds of the screen image; the film from which the image is projected cannot be easily updated, unless it is a computer file.

3. These two pairs are adapted from Espen Aarseth's typology of user functions and perspectives in cybertexts, which is itself part of a broader cybertext typology (*Cybertexts* 62–65). But I use different labels that shift the emphasis toward the user's relation to the virtual world.

4. See Lev Manovich's definition of a database in the introduction to this section.

5. For instance, Michael Joyce, *afternoon;* or Mark Amerika, *Grammatron.*

6. The best examples of this type of work are two hypertexts by M. D. Coverley, *Califia* (Eastgate, 2000), and the work in progress *The Book of Going Forth By Day.*

7. MUD stands for Multi-User Dungeon and MOO for Multi-User Dungeon, Object Oriented. *Object Oriented* refers to the programming technique.

8. The earliest MUDs were textual game environments with a built-in plot. (The acronym refers indeed to the role-playing game Dungeons and Dragons.) In the 1980s and 1990s MOOs developed into chatrooms and social meeting places, and the system-defined plot was lost. But the idea of a combination of goal-driven, emplotted game action and free talk was resurrected in the late 1990s with enormously popular games, the so-called massively multi-player role-playing games, such as Ultima Online and EverQuest. In contrast to the earliest MUDs, these environments offer textual communication in a graphically represented world. Players, who number in the hundred thousands, no longer need to create their characters through verbal description; they can construct the appearance of their avatar from a menu of visual elements.

9. Selmer Bringsjord, a computer scientist who has developed a state-of-the-art story-generating program called Brutus, has argued, with the support of logical proofs, that AI will never produce characters approaching the complexity of human-generated literary characters. His argument offers a sobering rebuttal to the prophecies of cyber gurus such as Ray Kurzweil, who claims that by 2029 many of the leading artists, including novelists, will be machines (223). For Kurzweil, however, the machines take a shortcut that renders the development of AI algorithms unnecessary: they are able to write novels because nanotechnology allows the downloading of the human brain into digital circuits. The mind of Proust

preserved in silicon will be able to create literary masterpieces forever. But will this silicon Proust qualify as a machine?

10. Not all game developers would agree with this statement. For Brenda Laurel, whose now defunct company Purple Moon developed games for girls that tried to address issues specific to the experience of growing up female, narrative content is not instrumental but central to the gaming experience. The ultimate purpose of the Purple Moon games was to provide "cultural content" through stories, as did myth in ancient societies (*Utopian Entrepreneur* 61).

11. Theresa Senft's term (qtd. by McLemee 7).

References

Aarseth, Espen. *Cybertext. Perspectives on Ergodic Literature.* Baltimore: Johns Hopkins University Press, 1997.

Amerika, Mark. *Grammatron.* <*http://www.grammatron.com*> (April 28, 2002).

Barthes, Roland. *S/Z.* Trans. Richard Miller. New York: Hill and Wang, 1974.

Bringsjord, Selmer. "Is It Possible to Build Dramatically Compelling Digital Entertainment (in the form, e.g., of computer games)?" *Gamestudies* 1 (2001). <*http://www.gamestudies.org/0101/bringsjord/index.html*> (April 30, 2002).

Coover, Robert. "Literary Hypertext: The Passing of the Golden Age." <*http://www.feedmag.com/document/do291lofi.html*> (March 24, 2000; no longer available).

Coverley, M. D. *Califia.* Watertown MA: Eastgate Systems, 2000. (Hypertext software.)

———. *The Book of Going Forth by Day.* <*http://califia.hispeed.com/Egypt*> (April 28, 2002).

Davenport, Glorianna. "Your Own Virtual Storyworld." *Scientific American* (November 2000): 79–82.

Grodal, Torben. "Stories for Eye, Ear, and Muscles: Computer Games, Media, and Embodied Experiences." *The Video Game Theory Reader.* Ed. Mark J. P. Wolf and Bernard Perron. London: Routledge, 2003. 129–55.

Hayles, N. Katherine. "The Transformation of Narrative and the Materiality of Hypertext." *Narrative* 9.1 (2001): 21–39.

Joyce, Michael. *Afternoon, a Story.* Watertown MA: Eastgate Systems, 1987. (Hypertext software.)

———. *Of Two Minds: Hypertext, Pedagogy, and Poetics.* Ann Arbor: University of Michigan Press, 1995.

Kelso, Margaret Thomas, Peter Weyhrauch, and Joseph Bates. "Dramatic Presence." *Presence: Teleoperators and Virtual Environments* 2.1 (1993): 1–15.

Kolko, Beth. "Building a World with Words: The Narrative Reality of Virtual Communities." *Works and Days* 13.1–2 (1995): 105–26.

Koskimaa, Raine. Digital Literature. "From Text to Hypertext and Beyond." Ph.D. diss., University of Jyväskylä (Finland), 2000.

Kurzweil, Ray. *The Age of Spiritual Machines.* New York: Viking, 1999.

Landow, George P. *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology.* 1992. Reprint. Baltimore: Johns Hopkins University Press, 1997.

Laurel, Brenda. *Computers as Theatre.* Menlo Park CA: Addison-Wesley, 1991.

———. *Utopian Entrepreneur.* Cambridge: MIT Press, 2001.

Mateas, Michael, and Andrew Stern. "Towards Integrating Plot and Character for Interactive Drama." Working Notes of the Social Intelligence Agents: The Human in the Loop Symposium. AAAI Fall Symposium Series. Menlo Park CA: AAAI Press, 2000. Version used here online at: <*http://www-2.cs.cmu.edu/~michaelm/publications/SIA2000.pdf*> (April 24, 2002).

McLemee, Scott. "I Am a Camera." *Lingua Franca* (February 2001): 6–8.

Murray, Janet E. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace.* New York: Free Press, 1997.

The Nerdman Show. <*http://www.nerdman.com*> (April 28, 2002).

Olafson, Peter. "~~Game~~ Theory." *New York Times,* October 5, 2000.

Ryan, Marie-Laure. *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media.* Baltimore: Johns Hopkins University Press, 2001.

Sloane, Sarah. *Digital Fictions: Storytelling in a Material World.* Stamford CT: Ablex, 2000.

Walton, Kendall. *Mimesis as Make-Believe: On the Foundations of the Representational Arts.* Cambridge: Harvard University Press, 1990.

White, Hayden. "The Value of Narrativity in the Representation of Reality." *On Narrative.* Ed. W. J. T. Mitchell. Chicago: University of Chicago Press, 1980. 1–24.