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Multimodality in the context of cyberliterature – have the new electronic media revolutionized a narrative?

With the rise of new electronic media, literature seemed to go through a radical metamorphosis. Technological innovations contributed to the perception of cyberliterature as the antithesis to a traditional narrative. Hyperfiction is no longer to be simply read; it can contain audio files, creative graphical layout or animations. In particular cases (e.g. *Arteroids* by Jim Andrews) its content can be modified by the user/reader. The crucial question is, however, whether multimodality really altered the way we experience narratives? Maybe ”Cybertext, then, is not a “new” and “revolutionary” form of text, with capabilities only made possible through the invention of the digital computer” *(*Aarseth 1997: 18)? As shall be demonstrated, the dividing line between new and old text media is not as clear-cut as it seems to be. Cyberliterature indeed has not become a fully innovative concept yet and new electronic media do not necessarily afford unprecedented opportunities for multimodality in narrative contexts.

The following paper is divided into two main parts. The first one focuses on solely technological characteristics of cyberliterature. The examples from the IT branch are briefly mentioned as points of reference. In the subsequent section the technological medium is put aside and the cyberliterary examples are analyzed according to correspondence analysis, used by Aarseth in his cybertextual study.

1 Technological point of view

For the last three decades various solutions were incorporated in the IT branch. The field of cyberliterature, however, was and is greatly neglected in this respect. By the

time the first commercial VR system (Virtual Reality) was introduced by VPL and Autodesk (VR CAD) in 1989, cyberliterature was taking steps merely towards the hypertext direction (1990 *Afternoon: a story* by Michael Joyce). It is only for the last ten years that multimodality (more advanced than the simple combination of text and image) has begun to familiarize itself in the literary world. The following section will introduce particular examples of its application in digital technology and contrast them with the ones relating to cyberliterary works. It will be demonstrated that new electronic media do not necessarily afford unprecedented opportunities for multimodality in narrative contexts. And even if various technological innovations are introduced in entertainment industry, they rarely reach literary environments to an extent they do in other media.

1.1 Application of multimodal sensory input in digital technology

”The human is adept at integrating sensory inputs and fusing data to meet needs of the moment. Machines, to date, are less able to emulate this ability. This issue is central to current research in multimedia information systems” (Flanagan 2007). Indeed, people do not find it difficult to generate transformations from one communication mode to another or even to make them run parallel. We interpret multimodal input and immediately generate the corresponding output. Humans can effortlessly map from images to text (event descriptions on the radio) and from text to images (a story converted into a slide show). For the machine, however, this operation is quite a complex challenge. Several projects were developed as far as the transformation from text (either spoken or written) to image is concerned. Despite certain progress, there is still a lot to be done in this field.

One of the research projects is the AnimNL (Animation from Natural Language),

which was carried out in 1995 by the Center for Human Modeling and Simulation (HMS) and the Language, Information and Computation (LINC) Laboratory. The aim of the study was to demonstrate the interpretation of language instructions by means of computer animated figures responding to them. Semantic interpretation, plan inference, planning, simulation and human figure animation are involved. A participant, thus, gives a certain command and a virtual reality human agent responds to it. Of course, the scope of the conversational possibilities is narrowed down to particular requests connected to the virtual environment. The virtual agent can for instance open the door or "unplug the vacuum cleaner" (http://hms.upenn.edu/software/AnimNL/animnl.html).

Cross-modal correspondence is also a crucial phenomenon in case of the latest Stock Exchange multimodal application designed by IntuiLabs. The demo version presents how voice and gesture may be combined with graphical layout. IntuiLabs application is a useful tool for buying or selling shares. One may use a finger or pen-based interaction. In case of audio communication, the program responds in short sentences, while graphical data is displayed on the screen. Thus, both modalities can be combined very effectively, making the human-machine interaction relatively easy and fast.

The following multimodal platform is a good example of an advanced transition from speech and tactile modality into speech and visual output. For the last couple of years the term IntelliMedia (Intelligent Multimedia) has established itself in the multimodal discourse. It combines not only computer science, but also artificial intelligence and cognitive science. IntelliMedia applications (similarly to the IntuiLabs demo mentioned above) allow people to interact with machines. Even gestures and body language have been applied to a certain extent. Researchers at The Institute for Electronic Systems at Aalborg University (Denmark) created a project called

CHAMELEON – an IntelliMedia platform joining various multimodalities. One of its platforms (*IntelliMedia WorkBench*) is responsible for giving information ”on the architectural and functional layout of a building” (Brondsted 2002: 153). A user, having 2D architectural plans of a given building at her disposal, can ask questions about them. Audio modality is combined with a visual and a tactile one. The program gives the possibility to ask a question (e.g. How to get there?) pointing to the requested place on the plan. The camera attached to the ceiling is responsible for the visual interpretation, while human speech is generated by the computer program. Thus applying both speech and pointing input, the received output is synchronized speech synthesis and pointing (a route drawn with a laser).

The examples relating to the IT branch could be multiplied. They are, however, not the main focus of the paper. A few applications mentioned above constitute a very general picture and serve as a point of reference for the following multimodal literary works.

1.2 How multimodal is cyberliterature?

As has been illustrated in the previous section, multimodality is widely used and constantly improved in the digital technology solutions. IT applications usually combine perception as well as production, making the human-machine interaction its main objective. The progress in this field is very fast due to its high practicality. The situation is completely different with reference to literature. Although technological innovations contributed to the perception of cyberliterature as the antithesis to a traditional narrative, they still constitute only a small fraction. Hyperfiction is no longer to be simply read; it can contain audio files, creative graphical layout or animations – this is unquestionable. However, as will be illustrated in the following section, the advancement of

multimodality in cyberliterature is very insignificant when compared to IT solutions. There are no instances of input and output multimodality (perception and production) applying to cyberliterature. A reader has various perception modes at their disposal, but a real interaction never takes place. Thus, cyberliterature indeed has not become a fully innovative concept yet. To support the thesis the phenomenon will be analyzed with reference to certain multimodal criteria, such as the presence of: audio files, animation, game elements and interactivity.

Before evaluating the specific examples, a precise definition of interactivity in literary environments should be established. First of all, as far a hyperliterature is concerned, there is no interactivity as such. A reader/user cannot expect any meaningful reaction from the literary piece. The system will not interpret their behaviour and respond to it. Interactivity is understood here as the possibility to manipulate the content of the work on the part of the user. Thus, a simple rearrangement of the work's elements, the possibility to add new information or experience different perception modes would be referred to as interactivity. Other perception channels, such as tactile and speech are not included at all. The analysis will be performed on the following examples:

- *These Waves of Girls* by Caitlin Fisher (cybernovel)
- *Afternoon: a story* by Michael Joyce (cybernovel)
- *Liquid Reader* by Michael Fredericson (cyberpoems)
- *Arteroids* by Jim Andrews (cyberliterary poetry game)

Most of the abovementioned examples (except for *Afternoon*) were created during the last few years. They constitute, thus, quite a recent picture of the cyberliterary world.

To make the analysis more complete, the four chosen examples include prose as well as poetry. The literary works are evaluated according to the criteria presented in the table 1.

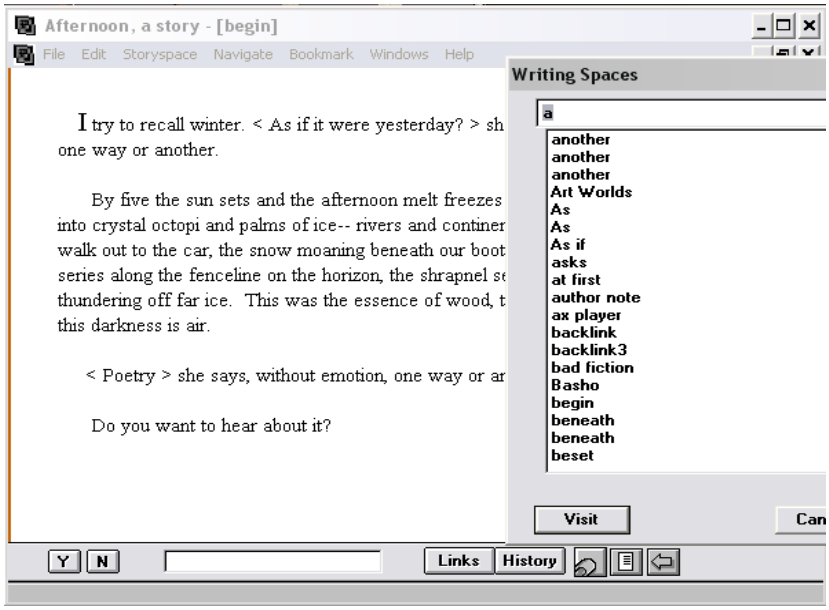
Table 1 Multimodal criteria

Multimodal criteria:	***Arteroids (2004)***	***These Waves of Girls (2001)***	***Afternoon: a story (1990)***	***Liquid Reader (2007)***
Hypertext / nonlinearity	**yes***	**yes**	**yes**	**yes***
Audio files	**yes**	**yes**	**no**	**yes**
Animations	**yes**	**yes**	**no**	**yes**
Game element	**yes**	**no**	**no**	**no**
Visualizations	**yes**	**yes**	**no**	**yes**
Interaction	**yes**	**no**	**no**	yes (to a certain extent)

*** nonlinearity is applied differently than in case of hypernovels** (Cyberpoems can be written/created and read nonlinearly; they do not, however, entail a pure hypertext. A poem constitutes too short a form for the extensive linking patterns to be functional. In *Liquid Reader* nonlinearity is achieved by various types of animation.)

Starting from *Afternoon* - a hyperfiction classic – we can observe that it entails only one multimodal criterion. It was created in *Storyspace* and its main objective was to be structurally complex. The multiple lexias are combined in a web and constitute an intricate hypertextual pattern. There are, however, no audio files, animations or even simple visualizations included. The following screenshot summarizes the simplicity of *Afternoon.*

Fig. 1. Screenshot from *Afternoon: a story*



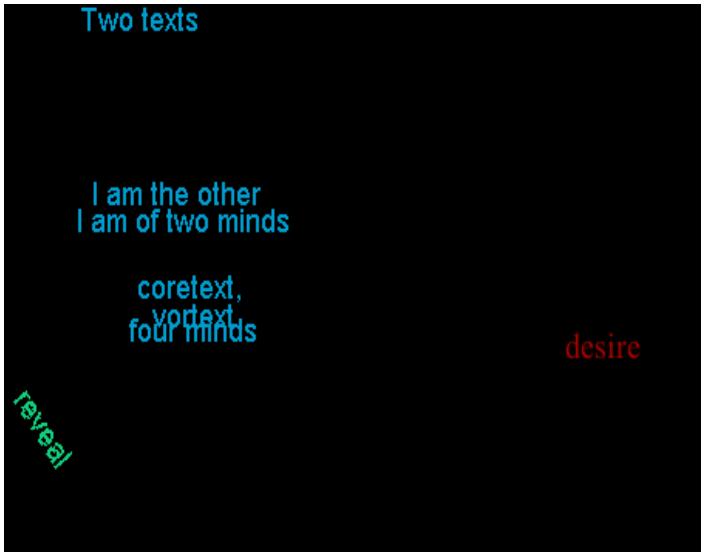
The beginnings of hyperfiction were directed mainly towards the hypertextual linking. In 1995 Eastgate Systems published *Victory Garden* by Stuart Moulthrop, another hypernovel written in *Storyspace*. Although five years passed the novel was as multimodally raw as its predecessor.

More recent cyberliterary projects include a lot more instances of multimodality. *These Waves of Girls* fulfill most of the multimodal criteria. The novel does not implement any game elements and does not offer interactivity. It is, however, very attractive when it comes to visualizations, animations and audio effects. Also navigation is more user-friendly. As a result readers have greater control over the reading process and experience looping less frequently than in case of *Afternoon*. Still, when compared to IT solutions, even *These Waves of Girls* leave much to be desired as far as technological medium is concerned.

Cyberpoetry seems to be more flexible in this respect. The above table includes only two examples, but they demonstrate a general tendency in cyberpoetry. The most recent project by Michael Fredericson fulfills most of the multimodal criteria. Interaction is only partially implemented and does not offer any complex solutions to the reader. After typing one's age, sex and the time of access, the program will generate one of the four poems available. Each of them is, however, animated in a different way and an audio file is attached to it. Also a brief remark on the content of Fredericson's poems should be made. Many critics perceive cyberliterature as an interesting phenomenon from the technological point of view. Yet not much literary merit is ascribed to it. *Liquid Reader* should be definitely valued from both points of view.

The last example resembles more a game than a poem. *Arteroids* are a very accurate exemplification of the interaction. A user creates art by moving text objects and shooting other objects. In the game mode a user/player/reader has a text *poetry* at her disposal as a gun. Other words (e.g. *all, is, poetry is* etc.) should be shot down. As a result their components disperse all around, creating something of a concrete poem, whose meaning is covered behind the original text forms and unintelligible when scattered. In the play mode the user's choices are even more creative. One may formulate her own words or phrases to be shot or to shoot with. It is also possible to choose the appropriate game level and to adjust the audio effects. Here, the author seems to be more of a programmer supplying her readers with a tool, with which they can create their own poetry.

Fig. 2. The game's screenshot (the word *desire* serves as a gun here; the bullets are released, when the x button is pressed). (adapted from the web site)



There are few cyberliterary works that would entail interactivity to such an extent as Andrews' work. With time the reception of cyberliterature becomes more technologically attractive to its readers. Despite this fact its inventiveness stays years behind IT. Cyberfiction does offer different experience than the codex. We should not, however, dignify it unconditionally and attribute literary revolution to it.

1.3 Conclusions: the role of multimodality in literature

After presenting and analyzing multimodal applications in cyberliterature and contrasting them with digital technology, a natural question referring to the role of multimodality in literature arises. What does it change, if it changes anything? Or maybe Aarseth's thesis that apart from all the technological innovations, nothing has altered in the very perception of literature, is an accurate one? First of all, the function of multimodality does not seem to be as practically significant (and maybe that is the

reason it is so uncommon in academic discourse when compared to IT) as in case of IT solutions. On the basis of only a few abovementioned high tech examples, the whole functional analysis could be developed. But is literature practical and does it need the same type of justification? In *The Role of Multimodality in Language and Speech Systems* we read: ”From a system-design point of view, different modes of presentation can complement each other and provide different types of information” (Grandström, House, Karlsson 2002: 1). With reference to digital technology, the importance of the application of various modes is quite clear. When it comes to literature, the issue is more problematic as the concrete function of multimodality is not visible from first glimpse. Before further examination, it should be mentioned that certain multimodal combinations, such as text and image, are nothing new in literature. Illustrated books appeared long ago before cyberliterature came into existence, the only difference being their non-digital format. The inclusion of other modalities, however, was not possible due to technological limitations of the paper medium. Now, many cyberliterary works include various animations (also in the form of flash installations), audio wav files or interactive game elements. The tendency to include all those diversified modalities is “[...] the reflection of a changing communicative landscape (i.e. stronger reliance on modes other than language) [...]” (Stöckl 2004: 9). In many instances, linguistic descriptions become redundant. As a result some of the literary passages might exert a stronger aesthetic influence on the reader.

By dint of multimodality literature became a more attention-getting phenomenon. New audience is used to multimedia projects in many fields. The change of reality is reflected in entertainment, arts and in literature to a great extent. That is why it is crucial for cyberliterature to follow new technological trends and accommodate to the new

reality. As has been presented in this chapter, the advancement of new technological achievements in literature still leaves much to be desired. There is, however, a strong tendency to include more and more innovative applications. Hopefully, within the next few years, hyperfiction undergoes further metamorphosis and catches up, at least to some degree, with IT solutions.

2 Technological arguments aside

Cyberliterature is, however, not only about technology and multimodal solutions. When analyzed with reference to the codex, many of its characteristics are congruent with those belonging to traditional literature. At the surface it may seem as if hyperliterature had nothing or at least very little in common with its ancestors. And yet, as will be demonstrated, the dividing line between new and old text media is not indubitable. This section will follow the argument of Espen J.Aarseth, whose main assumptions are as follows: “Cybertext, then, is not a “new” and “revolutionary” form of text, with capabilities only made possible through the invention of the digital computer. Neither is it a radical break with old-fashioned textuality, although it would be easy to appear so” (Aarseth 1997: 18).

As has been stated previously, the correlation between those two modes of literature is debatable. There are some papertexts with the characteristics of hypertexts and vice versa. In this part of the paper Aarseth's typology of media diversity will be presented and the difference between the two media will be analyzed on the basis of certain variables. To do this Aarseth uses the Program *Analytica* and employs correspondence analysis. This method, mostly used in economy, has been for the first time applied in literary studies. Instead of refuting various narrative theories by means of philosophical

discourse, concrete, mathematical data is included. On the basis of the graphical diagrams, the congruence between paperliterature and cyberliterature will be demonstrated. Because of the space limitations of this paper only three variables will be elaborated on, namely:

1. **Perspective:** If the user is required to play a strategic role in the world described by the text, the role is personal. If, however, the only activity required is reading, the role is described as impersonal. In a MUD the reader has the freedom to create her own character, add new rooms and manipulate the fiction world to some extent. Such a personal role is impossible with reference either to traditional literature or to classic hyperfiction.

2. **Access:** If all the scriptons are available to the user/reader at every point of the reading process, the access is random (as in the codex – papertext); if not, the access is controlled (for example *guard fields* in case of *Storyspace*). A traditional novel can be entered at any chosen point. This, however, is not possible with reference to a hypernovel, whose structure is preprogrammed by the author. As has been mentioned in the previous part of this section, the reader's freedom of choice is only illusionary. The reader can follow only the paths, which were created by the author. "In other words, hypertexts without free text search capabilities are more, not less, linear than the codex" (1997: 63).

3. **User functions:** Except for the interpretative function, which, according to Aarseth, is present in all texts, he distinguishes additional functions:

- **explorative:** the reader decides which path to take
- **configurative:** the reader partially creates the scriptons

- **textonic:** the reader adds scriptons permanently

- **interpretive:** the reader makes decisions concerning the text's meaning only

2.1 Analysis

For his analysis Aarseth choses a wide range of texts including the codex as well as digital texts. Evaluating the examples according to the selected variables, he demonstrates how closely related those two types of literature might be. Table 2 presents the two most concomitant examples adapted from Aarseth's study. As can be seen they differ only in terms of linking and access.

Table 2 Comparison between hyperfiction and traditional literature

Texts	**Dynamics**	**Determinability**	**Tran-siency**	**Perspective**	**Access**	**Linking**	**User funct.**
Afternoon	Static	Determin.	Intran.	Impersonal	Con-trolled	Conditional	EF
Hopscotch	Static	Determin.	Intran.	Impersonal	Random	Explicit	EF

As *Hopscotch* belongs to the codex, all of its content is available to the reader. The book can be opened at any page. In case of *Afternoon* access is controlled by the so called guard fields. It is not always possible to enter every single lexia without visiting other lexias previously. The two other variables, which are of interest to us, remain unchanged. In both cases perspective is impersonal, that is a reader cannot influence the work as such and no creativity is demanded from her. User functions are classified as explorative, which is the most common scenario for cyberliterature. Configurative or textonic functions appear very rarely. In table 3 only *Arteroids* fall under configurative category.

Before drawing conclusions from our four cyberliterary examples, a graphical diagram with Aarseth's examples should be presented. As can be observed in fig. 3 cyberliterary works overlap with those belonging to the codex. For instance, in the

upper right square we have *Afternoon* and *Victory Garden* placed next to *Hopscotch*. The left lower square includes such diversified examples as *I Ching* and MUDs. In table 3 a few examples from Aarseth's study are presented. Great similarities between cyber and traditional literature can be distinguished.

Table 3 Chosen Texts by Typology Variables (adapted from Aarseth 1997: 68)

Texts	**Dyn-amics**	**Deter-minability**	**Tran-siency**	**Per-spective**	**Access**	**Linking**	**User Funct.**
Com-position No. 1	Static	Indeterm.	Intran.	Impersonal	Controlled	None	IF
I Ching	Static	Indeterm.	Intran.	Personal	Controlled	Con-ditional	CF
MUD1	TDT	Indeterm.	Transient	Personal	Controlled	Con-ditional	EF
Victory Garden	Static	Determin.	Intran.	Impersonal	Controlled	Explicit	EF

A diagram presenting all the examples chosen by Aarseth can be found on page 71 of his "Cybertext: Perspectives on Ergodic Literature." (1997: 71).

The following table demonstrates more recent examples, which are analyzed according to Aarseth's variables. When compared to older cyberliterature or to the traditional works from table 3, only *Arteroids* seem to differ considerably, above all in terms of perspective and user functions. Taking into consideration the three chosen variables (perspective, access and user functions) all of the other cyberliterary examples do not divagate much from the codex. As far as *Afternoon* is concerned, the user's creativity ends up on mere reading. Thus, the perspective is impersonal and the user's function explorative. The same pattern corresponds to the two latter works. What differs *Afternoon*, *These Waves* of Girls and other hyperprojects from traditional literature is

the access, which is controlled in every instance. Analyzing *I Ching* from table 3, we can observe that it is far more innovative than cyberfiction introduced in table 4. It should be emphasized that the variables chosen by Aarseth constitute one among many other possibilities. Also the selected range of examples could be subject to change. Despite those objections, the analysis does lead to intriguing conclusions.

Table 4 Cyberliterary examples classified according to Aarseth's variables

Texts	**Dyn-amics**	**Deter-minability**	**Tran-siency**	**Pers-pective**	**Access**	**Linking**	**User funct.**
Arteroids	IDT	Indetermin.	Intransient	Personal	Controlled	None	CF
Afternoon	Static	Determin.	Intransient	Imperson.	Controlled	Con-ditional	EF
These Waves of Girls	Static	Determ.	Intransient	Imperson.	Controlled	Explicit	EF
Liquid Reader	Static	Determin.	Intransient	Imperson.	Controlled	None	EF

3 Conclusions

Correspondence analysis, the results of which have been presented in this chapter, is an economic tool for the first time applied in literary studies. The outcome of the analysis brought astounding and strong arguments against the novelty of cyberliterature. It does not mean that the data and the choice of the criteria is unquestionable. It illustrates, however, that despite hyperliterature's great potential, its recent achievements in comparison to paperliterature are not revolutionary yet. Since Aarseth's *Cybertext: Perspectives on Ergodic Literature* was published in 1997, his variables were applied to the contemporary cyberfiction work. Ten years might seem long enough for the technological development to influence and alter literature. As it has been

presented, Aarseth's criteria still have the analytical power with reference to most of the examples. The shape of hypernovel as such has altered within the last 15 years. Graphics and animation play an important role in the presentation of the story (in comparison to the hyperfiction classics such as *Afternoon* or *Victory Garden*). Yet, as far as the technological innovations are concerned, there is still much to be desired. Graphical layout might have made reading more attractive, but as the results of the correspondence analysis demonstrate, there is no fundamental difference between cyber and paperfiction. Innovatory cyberliterature is de facto still a niche and technology has not been applied to such a degree as to make Aarseth's criteria inapplicable. The argument gains even more power, when contrasted with the concept of multlimodality in cyberliterature. Paralinguistic means of presentation are to a great extent technologically underdeveloped and only partially implemented. Despite the use of various visuals and animations, such paralinguistic elements as haptics or olfactics are still exotic to hyperliterature.

4 Final conclusions

In this paper cyberliterature has been evaluated from two distinctive perspectives. On one hand the fact that it is inherently connected with the digital medium cannot be disregarded. On the other, despite being a new literary phenomenon, hyperliterature should not be analyzed in isolation from its traditional counterpart. Both literary worlds form a socio-cultural continuum and it is impossible to draw a dividing line between the two. Also, adopting only one of the abovementioned points of view (either technology oriented or disregarding technological medium) is very confining. Thus the very technological aspect needs to be taken into consideration. We cannot, however, detach ourselves from the codex, which is the basis for experimental literature and which also

includes many instances of non traditional works.

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