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Hypertexts and Reader-Engagement: Reading, Writing, Adapting

Because "hypertext is a mental process, as well as a digital tool,"[1] the digital medium influences how we read and write, and changes the ways we interact with texts. Readers have always been free to interact with any text in imaginative, cognitive and emotionally active ways, and they continue to be able to do so in the new medium as well. What is added to these existing interactive dimensions involved in reading in the digital medium is the "participatory" mode, the physical engagement with the text and its world.[2] Reading in hypertext can demand and encourage all modes of interaction—imaginative, cognitive, emotional and physically participatory—and it is the new combination that accounts for the difference from previous modes of engagement with texts. The hypermedia are shaping appropriative readers who are self-consciously involved in the making of meaning and knowledge construction. Traditionally, readers read in order to comprehend and interpret. In many hypermedia environments, however, the reader is often invited to be the writer, empowered to change the "source" text, to interfere with its content and form, and to adapt it or parts of it to idiosyncratic purposes. Readers are often encouraged to choose the order of what they are reading, alter it by their choices, and add their own material to existing hypertext systems. They can rewrite the origin-

text and create new systems of meaning. By virtue of the nature of the medium itself, reading in hypertext is an interactive activity that involves re-inscribing, adapting, restructuring. It allows for easy physical rearrangement, de-contextualisation and re-contextualisation of existing reading materials into new schemes and contexts determined by the readers' own purpose. Reading and writing in hypertext have thus been re-imagined in terms of rhetorical possibilities realised through the readers' active involvement in linking possible textual selections and combinations.[3] Rather than reading in order to comprehend and interpret only, in many hypertext environments readers have to read and comprehend in order to write: that is, they have to read in order to (re)interpret and (re)create. This new nature of interaction results in new cognitive skills, and changes how we think of reading and writing.

Not all hypertexts are interactive in this way; many are just as linear as any printed text and do not make significant new cognitive demands on readers. In many cases readers tend simply to transfer old reading habits formed in the Age of Print to reading in hypertext, and the extent of their physical participation is limited to several mouse clicks. But many reading situations in hypermedia, especially those created by hyperpoetry and hyperfiction, place on readers a new set of cognitive demands resulting from the new combination of modes of engagement. Many so-called informational hypertexts do the same thing, since they, too, often dictate new ways of structuring information, managing data and communicating. We do not have, as yet, extensive research into the cognitive processes involved in reading in hypertexts, nor a comprehensive assessment of hypertexts' potential impact on and implications for reading and writing.[4] What we do know from cultural and media theorists, however, is that in the hypermedia "what before had been a mental process, a highly individual state, now became part of the public sphere."[5] Hypertext externalises many cognitive processes, and encourages in

readers "fundamental cognitive skills and intellectual tasks that experts in various disciplines use routinely, subtly and self-consciously in accomplishing intellectual tasks."[6] But what are those cognitive skills that experts use and that are encouraged by some hypermedia environments? And what conceptual framework can we use to engage with the nature of these new cognitive demands? In this paper I suggest that recent theoretical perspectives on the concept and practice of adaptation provide one conceptual framework for investigating the nature of this changing interaction and its cognitive consequences in relation to reading and writing in hypermedia. Many hypersystems blur the boundary between reading and writing, between interpreting and creating from existing materials, and encourage users/readers to think like adapters.

If we define adaptation as the process of fitting or suiting one kind of utterance/story/form/medium to another, modifying it to suit its new conditions, "transcoding," changing contexts, reinterpreting, or repeating with variation,[7] we can see that interactive reading and writing in the hypermedia embody many elements associated with the principle of adaptation. Adaptation means repeating with variation. To adapt something means to engage with source material, to establish and announce a relationship to it, so that "thematic and narrative presence combines with material variation."[8] The material variation often involves a transposition or transcoding from one medium, genre or register into another. The result of this transposition is a change of frame or context. As a way of thinking and a process of creation and reception, adaptation depends on (re)interpretation and then (re)creation of various elements or separate units of source material, during which process the elements or units themselves may change.[9]

The process of reading and writing in hypertext involves a number of activities associated with adaptation in its denotative sense, such as adjusting, altering, transforming, recreating, while maintaining a relationship with the source material or originating context. In hypertext the reading experience—informed by comprehension and interpretation—and the writing experience, as a form of creative output, are often inextricably linked.[10] The potential of hypertext to link inextricably these two processes stands in contrast to centuries of knowledge according to which the two have been taught and treated separately. The hypermedia fuse the categories of reader/audience and writer/creator. Indeed, many of those who write for the hypertext environment conceive of their works so that they can be adapted. Many hypertexts, especially in the realm of fiction, are created so that readers can become adapters, and in some cases, explicit co-creators: readers have many choices along the reading path; they are invited to use elements of text and rearrange them, to transform them into new wholes and contribute to existing texts. By highlighting the need for selection and subsequent rearrangement, hypertexts often compel readers to adopt the role of an adapter—one who is first an audience and an interpreter and then a creator; one who appropriates, takes possession of another's text and filters it through personal sensibilities, interests and talents, and recreates it into another context while maintaining and announcing a relationship with the source material.

Whether we are aware of it or not, we live in a culture of adaptation. If we take into account that adaptation includes almost any act of alteration performed upon specific cultural works of the past or present (cf. Hutcheon, 9), we may realize that we are immersed in adaptations not only in media such as TV, film, Internet, musical and dramatic stage, novels and comic books, but also in theme parks and video arcades. The concept of adaptation itself is clearly very broad. It plays a part in many cultural processes and encompasses important

aspects of human existence. Literature in both the sciences and the humanities indicates that the process of adaptation is important in explaining how we understand and interact with our surroundings, texts, and technology. In the evolutionary social sciences dealing with cumulative cultural adaptations, the concept is used to explain "the information processing properties of the human minds," and to argue that "cultural adaptation has played a crucial role in human evolution."[11] In the context of literary and cultural theory the concept has been recently applied to the investigation of the process of "cultural revision" in all media, and its distinctive cultural status.[12]

Rather than discussing adaptation in the context of "fidelity to the original," "cultural inferiority," "stealing" or plagiarism, new adaptation theory in the context of the humanities sees adaptation as a distinctive and pervasive cultural process and form, situating it within a long Western cultural tradition of borrowing and sharing ideas, narratives and parts of narratives to create new ones. Borrowing from the ancients, Shakespeare transferred his culture's stories from page to stage, and others like Aeschylus, Racine, Goethe and da Ponte, all retold familiar stories.[13] And this is not because those who came before us were in some way less creative or less original than we are. It is because the nature of creativity and originality was perceived in a different way. The ways of engaging with cultural texts in the pre-Romantic past always assumed and explicitly stated a relationship to existing or previous models. Rather than only being a product, an entity derived from another entity, adaptation ought to be understood also as a cognitive and "experiential" process, a way of thinking about reading, writing, creating, a way of being engaged with culture. It is this aspect of adaptation that is most useful in relation to the modes of engagement enabled in the new medium.

Without undue technological determinism, it is important to acknowledge that the new media do influence our ways of engaging with culture and modify existing notions about creativity. In interactive fiction in the hypermedia, for example, readers/viewers are not "voyeurs" in relation to texts. They are "connected to the story more than by means of emotional identification with a character, as in the telling and showing modes" adaptation theory associated with other media, like print and film.[14] The former passive "audience is lifted out of their seat of distanced contemplation and placed in the limelight of subjective physical involvement: addressed as a storyboard controller, co-author, actor or self-performer" so that they become active participants in a "heterocosm—either a fantastic or a realistic one."[15] In that sense, "if we think back to how important the soliciting of audience participation was for those classical theoreticians of rhetoric or for oral storytellers, we might get a clearer sense of how the audience can figure in the thinking of the adapter working in these emergent forms called 'interactive storytelling' made possible by the new broadband and virtual technologies."[16]

Technology and culture have always been interdependent. In relation to the new technology and some of the cognitive and kinesthetic aspects of engaging with hypertexts, the context of adaptation may help us situate the new media's "mode of address," audience reception and participation patterns[17] within a larger cultural and conceptual framework, and provide a perspective on the new technology that may reveal its relationship to other sociocultural phenomena, including those of the past. Technology has always "framed" and "driven" adaptation, in that the new media "have constantly opened the door for new possibilities" when it comes to modes of engagement with cultural texts.[18] In fact, the term "transcoding" used by adaptation theorist Linda Hutcheon to define adaptation as a cultural phenomenon, comes from computer programming, and refers to the process of converting any

media file or object from one format to another. In the words of media theorist Lev Manovich, "the computer layer" and the "culture layer" are "being composited together," and the result of this composition is a "blend of human and computer meanings, of traditional ways in which human culture modeled the world and the computer's own way of representing it."[19] These "conceptual transfers" from the computer world to the world of culture are not unusual, and provide conceptual gateways for exploring how the new media reconceptualise cultural categories and concepts, and enable new ways of cultural revision and participation.

The interdependence between the computer layer and the culture layer, or technology and cognition, and their relevance to the adaptation in the current context can be illustrated by some of the formal properties of the new medium. "The computer layer" is built on the principles of variability and repetition. Hypermedia systems "provide their users with the ability to create, manipulate and/or examine a network of information-containing nodes interconnected by relational links."[20] The hypermedia externalise the cognitive process involved in adaptation. In order to interpret and recreate origin-material, adapters will consider the various aspects of that material separately, re-conceiving the relationships and interconnections between structure and thematic elements, while adding something new to the existing material with each new interpretation. The cognitive process that depends on the separation of thematic and other conceptual elements, and structure, is externalised or embodied in the formal properties of hypermedia systems. While in old media, elements are "'hardwired' into a unique structure and no longer maintain their separate identity, in hypermedia elements and structure are separate from each other."[21] In hypermedia, the individual media elements (images, pages of text, etc.) always retain their individual, separate identity that can be "wired" together through hyperlinking into more than one object and often

in more than one way.[22] The variability and repetition of fundamental cognitive processes involved in adaptation, in addition to the demand for separating the units of existing materials that can then be "rewired" in new ways, are so formally embedded in the properties of hypermedia. Hypermedia systems by their formal nature enable and encourage into existence, as it were, the cognitive processes involved in the process of adaptation: transposition of elements or units from source materials (information-containing nodes) into different contexts, their (re)creation within different frameworks of meaning, repetition with variation while retaining a relationship with the source. The properties of the new media thus increase the potential for the occurrence of the kind of thinking underlying the process of adaptation.

Commenting on her experience of writing poems in hypertext, poet Stephanie Strickland captures the nature of the cognitive and experiential shift in reader engagement offered by the hypermedia:

> When a set of poems is composed in or into hypertext, the space in which they exist literally opens up. Released from the printed page into this floating space, readers are often uneasy. What is the poem? Is it a sum of every possible way to proceed, the sequence of such journeys, or one particular path privileged as a saved reading? Only slowly does one assimilate the truth that one may return each time differently.[23]

"Returning each time differently" encapsulates one of the dominant aspects of hypertext, as well as the process of adaptation, as repeating without replicating, or repeating with a variation.[24] Reading in this context becomes a mode of engagement that, like an adaptation, does not depend on "original narrative as only context." Readers are encouraged to create "multiple entrances and exits" from a text. As "wherever the reader plunges in, we find a beginning," linearity and narrative coherence become "a quality of the individual reader's experience."[25] To articulate the property of hypertext as multilinear, and to explain its

consequences for the reading process as Strickland does, means to invite readers to think like adapters and to transform the origin-text by choosing where it begins and where it ends. They are encouraged to adapt its parts to their own sense of narrative or poetic progression, and to use the result of this interactive experience to create a new sense of the whole. Here the text is conceived so that each reading act becomes an adaptation, a re-fitting, a transforming of the original.

Strickland's "The Ballad of Sand and Harry Soot" is a poem that exists in hypertext and in print, in which form it won the Boston Review Poetry Prize.[26] In adapting the poem to hypertext and transcoding it from print to the digital medium, Strickland created a guide for the reader, "How to Read This Poem." The three suggested navigation methods to be employed by the reader in any combination are the Random, the Complete and the Link-Driven reading. Just like adapters who are reading a text in order to adapt it, readers of this poem are encouraged to separate the theme and other elements of the poetic narrative from its structure. Due to the variability principle according to which the hypermedia operate, theme and structure can be considered separately. The potential for multiple adaptations of the existing text and its manifold reinterpretations are embedded in the format enabled by the medium. Thematically, the poem is about the passionate relationship between Sand and Soot, "silicon and carbon-based life."[27] Structurally, it is about the "art of navigation through multiple discourses that constitute human experience." As such, the poem creates a "multicourse," a web of "relations with limitless potential for diverging and converging series of readings." The "discontinuous succession of creative acts" in the poem mirrors the multiple readings these acts enable, each unique, "linked to the reader and the context in which the reading takes place."[28] Each hypertext reading enabled by Strickland's navigational methods represents a virtual adaptation

and a recontextualisation of the poem. Each of the three models of hypertext readings and the new combinations they enable adapt the print poem in different ways by rearranging and restructuring its parts into new wholes. Each reading involves reinterpretation, recreation and reordering using the existing elements of the poetic narrative.

Another kind of adaptation took place in the process of transcoding the poems from print into hypertext. Strickland retitled all her poems, an act through which the newly titled poems emerged modified, adapted to a new medium and a new audience. Retitling represents an adaptation in the sense that each new title creates a new reading and interpretive framework for each poem, foregrounding, in a literary and symbolic sense, the complex interpretive relationships created between the poem's text and its "name:"

> Since each of my poems already had a title, I did not wish simply to repeat that title as their screen address—so I chose a "second" title which would resonate with the first and with the poem…. Since it is possible to locate both the poem-title list and the lexia-list online, it is possible to arrive at a poem you have already read, but this time as it appears under another name. In this way, the text acquires a double, or a shadow—provided exclusively by the way it is named. This kind of shadow is a persistent concern in *True North*, and its formal implementation occurs quite naturally in a hypertext environment, whereas double-titling is so unconventional, and so unhappily accommodated on the print page, as to be unreadable on paper.[29]

In this sense, as in any process of adaptation, each new title provides a change of "frame" and therefore of context as well, since it situates each poem within a different point of view, which can create a "manifestly different interpretation."[30] Strickland sees this adaptive process as being "naturally" embedded in the hypermedia, and accomplishing a form of liberation of meaning with regard to her poems. Hypertext emphasises and formally enables the semantic multivocality inherent in poetic texts and language. It also makes more apparent the kind of thinking and interpretation done by an adapter, who is aware that reframing a narrative, or selected narrative elements, means reinterpreting it, and also, recreating it.

Holopoetry, poetry that that addresses language "both as material and subject matter," is another example of the way in which the hypermedia can realise the polysemic nature of language and experience in a non-linear, discontinuous way, and so enable various forms of adaptation to take place.[31] Eduardo Kac, the pioneer of holopoetry, describes his invitation to the reader to interact with his art and re-create it differently:

> I try to create texts which can only signify upon the active perceptual and cognitive engagement on the part of the reader or viewer. This ultimately means that each reader "writes" his or her own texts as he or she looks at the piece. My holopoems don't rest quietly on the surface. When the viewer starts to look for words and their links, the texts will transform themselves, move in three-dimensional space, change in color and meaning, coalesce and disappear. This viewer-activated choreography is as much a part of the signifying process as the transforming verbal and visual elements themselves.[32]

The readerly interactivity that is the basis of holopoetry in fact here extends beyond the Web itself as it often requires the combination of Web or virtual and actual presence in order for its spatiotemporal possibilities to be fully realised. Holopoetry combines image, sound and text in ways that "highlight the complex discontinuities that structure the syntax" of the poems, and illustrate the "fluidity of the verbal sign and semantic interpolation, i.e., mutability of the actual topology of words in space leading to changes in meaning." One such example is Kac's work shown at the InterCommunication Center in Tokyo in 1999, called *Uiapuru* (1996/99).[33] This interactive installation represents a flying fish that hovers above a forest in the gallery, responding to local as well as Web-based commands:

> Audio and video from its point of view are streamed on the Web. Local and remote participants interact with the avatar of the flying fish in a virtual world. When this happens the flying fish sings in the gallery. "Pingbirds" (robotic birds) sing Amazonian bird songs in the gallery in response to the rhythm of Internet traffic. Pingbirds monitor the rhythm of the Internet by sending ping commands to a server in the Amazon. This work unites telepresence, multi-user virtual reality, and networking into a single realm of experience.[34]

The hypermedia for Kac provides the means to create poetry where "syntax is organized in discontinuous space," and where "it does not matter if one is using phrasal, vocabular, syllabic or literal structures." Here the "performance" is intentionally shared: the artist creates a certain number of enabling structures of meaning, while the lexical, semantic or visual content or arrangement of the work of art is left up to each subsequent viewer/reader. This is what the artist calls "a viewer-activated text."[35] Each text-activation is another kind of adaptation performed by the viewer as each alters the originating holopoetic sequence. Like an adaptation, each takes place in the context of an "acknowledged transposition of a recognizable other work."[36] In this case, since the creator explicitly invites the viewer into an extended interpretive and creative engagement with the existing piece, the viewer does not take part in the process unconsciously, but is aware of her intentional participation in creating a new whole.

Kac himself performed a series of adaptations through which he modified poetry and language to make them suitable to the new conditions enabled by the new medium. He transferred poetry—a mode associated with linguistic expression, verbal or written—onto the new medium where it is adapted and modified to include image, sound and physical reader-involvement. Creating transpositions or adaptations across media, genres, registers and space, Kac relied on "double vision," as the kind of thinking done by adapters who know that "transmutation and transcoding" mean a "recoding into a new set of conventions as well as signs."[37] He had to consider the various existing elements of each medium, genre and register separately before recombining them, demonstrating an adapter's awareness that "different media will inevitably highlight different aspects" of the narrative.[38] Just as in other kinds of adaptation, "recognition and remembrance are part of the pleasure (and risk) of experiencing an adaptation,"[39] in Kac's art the viewer can recognise and remember traditional elements

associated with poetry as a mode, as well as the formal rules governing syntax. Knowing the usual qualities of both poetry and syntax, they can always feel their presence "shadowing" the one they are experiencing directly. Their current reception exists in relation to prior knowledge of medium, genre and register. The recognition and remembrance, combined with different kinds of "material variations,"[40] that is, change, result in the special pleasure associated with experiencing an adaptation.

In his hyperpoem, "Medical Notes of an Illegal Doctor," poet Alexis Kirke invites readers to envision this "collaborative poem" as a space for social dialogue, and creatively "mutate" the poem by entering their changes in the section, "text to be added or changed," which, after a few clicks, will transform the initial poem and adapt it to a new context.[41] Kirke openly establishes his text as a basis for adaptation as he tells readers they can "alter it in any way they see fit… add links, delete links, add to subpoems, remove from subpoems. Basically you can do what you like to any part of the text." The invitation for readers to engage in this social dialogue is compatible with the form of the origin-poem designed as a conversation among an "interviewer," a "whipper," and a "doctor." Like adapters, readers are thus invited to engage with the "original text" in ways that would make us see that text in different ways.[42] The poem hints that the doctor's practice may be illegal, but its exact nature is not specified. Instead the onus is placed on the moral and ethical dilemma faced daily by the doctor who, just like the "whipper," is "no stranger to pain." The poem makes ambiguous the difference between the two men's professions, as they both deal in human pain and suffering, often with the same result. The text invites readers to take part in a conversation about a potentially controversial social issue, and "indigenize it" by adapting its formal or thematic elements to different purposes or different audiences. Adapters dealing with existing narratives will often

indigenize them by adapting them to different national and cultural settings or times in order to highlight elements that otherwise may not be very obvious or unusual in the original.[43] With Kirke's poem, as in previous examples, readers have to engage in an adapting process, as they have to appropriate elements of an existing text, interpret them, and filter them through their own sensibilities, interests and talents.

Just as in relation to any other process of adaptation, fidelity to the original is in no way an adequate guiding principle. Whatever the motivation of the adapter/reader, "adaptation is an act of appropriating and salvaging, and this is always a double process of interpreting and then creating something new."[44] One of the culturally significant results of this kind of interaction is its potential to redefine the nature of authorship so that "the value of texts in the hypermedia often "becomes embedded in the social fabric, rather than the distributed product."[45] In this sense, the act of reading in the hypermedia has the potential to participate more explicitly in a general process of cultural revision and re-creation, influencing how we conceive of the relationship between authors and readers. This process has ideological implications as well. Just as "an adaptation is a derivation that is not derivative," "it is its own palimpsestic thing" and a "form of intertextuality,"[46] so each new reading has the potential to disrupt the traditional hierarchical relationship between reader and writer by assuming its own place in the network. The "flat, non-hierarchical network of hyperlinks," which is the model of data organisation and linking on the web, "assumes that any object has the same importance as any other, and that everything is, or can be, connected to everything else."[47] This poem is only one example of the capability of hypertexts and the online medium in general to "disrupt elements of priority and authority" in relation to the source material, but also its refusal to privilege one version over another.[48]

Michael Joyce's "Storyspace" also emphasises aspects of the principle of adaptation: selection, rearrangement, interpretation and creation of something new while retaining some relationship to the original material or its elements.[49] "Storyspace" is a software programme illustrating with particular vividness the close proximity of the processes of reading and writing, as well as the active quality of "problem solving" associated both with the process of adaptation and interactive storytelling in the hypermedia.[50] It allows the creation of many "maps" containing different bits of information, organised into sections that can be viewed simultaneously. The simultaneity allows readers/writers to experiment with organisation as they continue to discover different patterns of meaning by reinterpreting and rearranging the existing elements into new wholes. As such, "Storyspace" is what Joyce calls an "exploratory hypertext," where readers "control the transformation of a body of information" to suit their needs and interests.[51]

This software allowed Joyce to create "*afternoon*, a story" (1987), often called the first hypertext fiction, where readers are enabled and encouraged to engage in an adaptive process involving the manipulation and rearrangement of existing narrative "pieces" into different narratives that have different outcomes with regard to plot and character development. Hyperfictions like "*afternoon*" open themselves to being adapted in various ways, even in terms of narrative closure which is largely left for readers to decide, whenever they "feel the main narrative tensions are resolved and puzzles explained."[52] Like the adapter, the reader here has to take almost full responsibility for narrative progression and character development while rearranging the elements of the existing narrative. This very active role demanded of the reader in the new medium, "requiring considerable cognitive work," has proven to be unfamiliar and difficult for readers used to modes of "reading associated with escapism and so called 'ludic

reading' where we become fully immersed or 'lost' in the book in a cognitive and emotional way but where no direct demands are placed upon us for any other kind of engagement."[53] For some readers, the new kind of cognitive demand consisting of having to assume an active role in constructing narrative meaning results in "confusion and frustration from lack of coherence and structure." Based on their previous reading habits, these readers' desire to "find" rather than recreate the plot reflects the change in the mode of engagement with texts enabled by the new medium.[54] In order to address the apparent difficulty some readers have in reading and writing using "Storyspace," a new kind of software has been developed. The Fluid Reader simplifies the reader's role of adapter by making visible in the background an original "coherent narrative," so that "whatever exploration the reader chooses to indulge in (whatever alternative endings she chooses to activate), does not impede an overall narrative experience."[55] The Fluid Reader thus acts as a "transitional" kind of software, providing readers with a type of cognitive bridge between the older and newer models of engaging with texts.

Informational hypertexts, like scholarly essays available online, also often encourage readers to adapt the text to their reading needs. Many contain instructions on how to read the text divided into various segments accessible by navigating through links. Readers are invited to choose the functions those fragments are going to play according to their own interest and sense of narrative organisation.[56] These essays are most frequently organised episodically; the content is broken into relatively short units held together by loosely related ideas, each with a different title, and each connected to the next or the previous one with a link. Some are explicit in their invitation to readers to adapt the organisation to their individual need: "There are a number of ways to read this essay, none of which will exactly replicate the text of the talk I gave. Take *chances* with *your choices*."[57] The experience of reading in hypertext encourages

and enables reading not for "linear narrative" but for points of interest, empowering readers to shape and control the reading process by selecting and reading only those parts of texts that are memorable or relevant to them with the aim of recreating them in a different context.

The digital medium itself, enabling this kind of interaction and shaping a new mode of engagement with text, may be understood as the evolving and dynamic product of a series of adaptations from print, still images, moving images and sound media whose elements it has "borrowed," "reworked" and "reformatted" while maintaining an important relationship with each one, despite many of its distinctive properties. As such, from the standpoint of the history of technology, the hypermedia may be seen as an example of a complex cultural adaptation or a "recreation with variation" whose existence was enabled by the "cumulative improvement of technologies at the hands of many innovators."[58] While the new medium's borrowing and adapting elements from existing media has been explored in revealing detail,[59] what needs further investigation is its relationship with the register of oral communication. Readers and writers in the hypermedia have been adapting to the new medium elements of the "oral," spoken expression. Although most kinds of communication in the hypermedia are generally based on the act of writing and inscribing, computer-mediated communication (CMC) has adapted itself to the new conditions by incorporating elements from spoken language and verbal communication. If we think of adaptation as the action or process of fitting or suiting one thing to another in terms of CMC, then weblogs, email and other kinds of online conversation-enabling spaces illustrate the association between the spoken and written uses of language, and the suiting, fitting and borrowing that goes on from one register into the other. For example, the term "blogosphere" recalls another term, "logosphere," whose etymology reinforces the connections to oral expression: according to its Greek roots, *logo-* means "word,"

and "sphere" can be interpreted as "world," resulting in "the world of words, the universe of discourse" (*Wikipedia*). Blogs, especially, define the internet as a social space where participation refers to ways of interacting that simultaneously accommodate the rules of written and spoken communication. Many, especially those who came to the new medium early in life, often treat the interactions enabled by these communicative spaces informally. They habitually express themselves as they would in spoken communication, and their texts reflect an informal "oral" register in the lack of punctuation and capitalisation, and use of emoticons whose nature and meaning is modelled on body language. Series of highly descriptive emoticons denote various states of being, including surprise, envy, boredom, contentment, and a range of other gesture-based meanings, such as "it wasn't me," "crying," "my lips are sealed," and even the lack of words itself, as in a "speechless smiley."

In fact, the spoken register has adapted itself so well to the properties of the new media that some rules on email etiquette, invested in earlier protocols governing human communication, attempt to prevent the change from taking over. Reacting to the immediacy and thus informality of response typical of email communication and its potential to adapt sounds and body-language to written signs, these rules seek to regulate email in ways that would make it more clearly associated with the more formal written register. Given that "netiquette" seems to change almost as rapidly as the technology itself, users are generally advised to "take as much cues from what [they] see or hear happening in [their] correspondent."[60] However, the advice is articulated in terms that could easily apply to the nature of communication in spoken conversation, where the interlocutors take their cues from one another.

Hypertext thus compels us to reconsider the nature of text, reading and writing, as well as adaptation, in essential ways. By compelling readers to make decisions along the reading path, ranging from choosing where the text begins and ends, to an active rearrangement of selected textual elements, many hypertexts externalise and enact the text's capability to engender a variety of interpretations in different reading situations, and they so externalise the cognitive processes underlying adaptation. Regardless of whether readers interact with open or closed hypertexts,[61] the adaptive principle is embedded in interactive reading in the hypermedia. Although in many hypertext systems we may be as "much controlled as controllers," we are still immersed differently in a world in which we have to participate kinesthetically, rather "than with one we are either told about or shown."[62] This form of participation results in a different way of engaging with culture and existing cultural narratives. By encouraging a "piecemeal" approach to composition and to reading, hypertext provides us with the ability to create pastiche-like compilations by easily extracting bits of data in different forms out of their initial contexts, and then bringing them together in different wholes. Reading in hypertext is often described as "welding," "where the meanings extracted—decontextualized—from different parts of the text can be crafted—re-contextualized" into something new.[63] By revealing the close connections between reading and writing, interpreting and (re)creating, hypertext educates us into the kind of reading done by adapters. As such readers, we have to "learn new navigational strategies and accept a new and altered relationship with the creator of the work;" we have to make decisions as to how to "navigate" through the layering of textual meaning and learn how one kind of information can be applied to another context. In this way, we thereby have to figure "in the thinking of the adapter" and become familiar first-hand with the process of adaptation.[64]

Looked at in this way, the hypermedia extends or re-conceptualises the limits of current adaptation theory. In relation to narratives, textual or visual, adaptation is described as an "extended intertextual engagement with the adapted work" and assumes a stable, coherent entity referred to as adapted work or source. In contrast, in hypermedia the forms of adaptations performed may not always be extended, nor do they necessarily have to refer back to stable, coherent entities. The hypermedia sources whose elements can be borrowed and adapted—the information-containing nodes—may represent the adapted products of previous similar engagement and, being the products of the environment in which they exist, are unstable and variable. Also, within the existing context of adaptation theory, what is being assumed is not only the existence of the stable, coherent entity called the adapted text, but also the subsequent existence of a stable, coherent entity that is the result of adaptation. Hypertext redefines the limits of this process, since "every hypertext reader gets her own version of the complete text by selecting a particular path through it" and "every user of an interactive installation gets her own version of the work."[65] While in a traditional sense adapters often have the luxury of a stable source narrative/material whose elements they can then reinterpret, reorder and recreate, in hypertext the source material itself is often unstable, or at least without any of the initial narrative authority on which we still depend in our thinking. In relation to the new medium, it is thus more productive to understand adaptation as a cognitive and "experiential" process, a way of thinking about reading, writing, creating, and a way of being engaged with culture.

As an adaptive action that involves re-inscribing, recontextualising and restructuring, interactive reading and writing in hypertext reminds us that knowledge can be transmitted not only through self-referential, extended narratives emphasizing closures, but also as "collections of ideas that can arrange themselves into a kaleidoscope of hierarchical and associative

patterns—each pattern being adapted to the needs of one class of readers [and writers] on one occasion."[66] With hypertext we are encouraged to think in terms of "segmentation, juxtaposition, and connectedness," and associative rather than linear, "step-by-step" logic. We are unlearning forms of "psychological realism" reflected in print-oriented forms of text and narrative, and once again, remembering that "there is no chronology inside the head," we are learning to think in "discrete packages"[67] that can be reintegrated into new contexts. At the same time, the participatory model of engagement with the process of analysing, transforming, "repeating with variation," evaluating and reorganising, instructs us in a radical form of the art of adaptation. With these changes and the possibilities they imply, reading is "the process of 'finding' meaning, which is at once a fundamentally creative and also adaptive exercise," as "meaning is shaped" rather than "deciphered or uncovered."[68] It may also be that with the capacity of the new media to instruct readers *en masse* into the cognitive processes involved in adaptation, we are likely to redefine our relationship with cultural institutions and artifacts, and continue in what Linda Hutcheon refers to as "Western culture's long and happy history of borrowing… and sharing stories,"[69] and learn to value and celebrate the essentially collaborative, social nature of all creativity.

Notes

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[1] Paul Gilster, *Digital Literacy* (New York: John Wiley, 1997), 136.
[2] cf. Linda Hutcheon, *A Theory of Adaptation* (London: Routledge, 2006).
[3] Gregory Ulmer, "Grammatology Hypermedia" (*Post-Modern Culture* 1. 2, par. 8), accessible at: http://muse.jhu.edu/journals/postmodern_culture/v001/1.2ulmer.html
[4] cf. Aristidis Protopsaltis and Vassiliki Bouki, "Towards a Hypertext Reading/Comprehension Model,"*Proceedings of the 23rd annual international conference on Design of Communication: Documenting and Designing for Pervasive Information* (Coventry, UK, 2005, 159-166), 159. Retrieved 25 May 2007 from: http://portal.acm.org/citation.cfm?id=1085313.1085349

[5] Lev Manovich, *The Language of the New Media* (Cambridge, MA: MIT Press, 2001), 60.
[6] Michael Joyce, *Of Two Minds: Hypertext, Pedagogy and Poetics* (Ann Arbor: University of Michigan Press, 1995), 40.
[7] cf. Hutcheon.
[8] Hutcheon, 4, 6.
[9] cf. Hutcheon , 9-11.
[10] Gene Golovchinsky and Catherine Marshall, "Hypertext Interaction Revisited." (2000). *Journal of the Association for Computing Machinery* (2000), 177, retrieved on 25 May 2007 from: http://www.fxpal.com/publications/FXPAL-PR-00-082.pdf
[11] Robert Boyd and Peter J. Richerson, "Culture, Adaptation and Innateness," in P. Carruthers, S. Stich, and S. Laurence, eds., *The Innate Mind: Culture and Cognition* (in press), 13; retrieved 25 May 2007 from: http://www.sscnet.ucla.edu/anthro/faculty/boyd/Innateness%20ver%204.1.pdf
[12] Hutcheon, 171.
[13] Hutcheon, 2.
[14] Ibid., 136.
[15] Ibid.
[16] Ibid.
[17] Manovich, 7.
[18] Hutcheon, 29.
[19] Manovich, 46.
[20] Ibid., 40.
[21] Ibid., 41.
[22] cf. Ibid.
[23] Stephanie Strickland, "Poetry in the Electronic Environment," *Talk given at Hamline University, St. Paul, MN, April 10, 1997*, accessible at: http://www.altx.com/EBR/EBR5/strick.htm
[24] Hutcheon, 7.
[25] Ingrid Hoofd, "Aristotle's *Poetics*: Some Affirmations and Critiques," accessible at: http://www.cyberartsweb.org/cpace/ht/hoofd3.
[26] Strickland's poem is accessible at: http://www.wordcircuits.com/gallery/sandsoot/
[27] Jaishree K. Odin, "Image and Text in Hypermedia Literature: The Ballad of Sand and Harry Soot," *Image in Text and Hypermedia Literature, The Iowa Review Web* (September 2002), 14, accessible at: http://www.uiowa.edu/%7Eiareview/tirweb/feature/strickland/odin_hypermedia.pdf
[28] Ibid.
[29] Strickland.
[30] Hutcheon, 8.
[31] Kac, "Holopoetry and Perceptual Syntax," originally published in *Holographic Imaging and Materials* (Proc. SPIE 2043), Tung H. Jeong, ed. (Bellingham, WA: SPIE, 1993), 72-81. Retrieved on 4 September 2006 from http://www.ekac.org/holopholosphere.html
[32] Kac, "Holopoetry."
[33] For an image of this work, as well as other interactive poems by Kac, see http://www.ekac.org/interactive.html and http://www.ekac.org/allholopoems.html
[34] Kac, "Telepresence and Interactive Installations," retrieved on 20 June 2007 from: http://www.ekac.org/interactive.html
[35] Kac, "Holopoetry: The New Frontier of Language." Interview with Eduardo Kac, retrieved 4 September 2006 from http://www.ekac.org/IVinterview.html
[36] Hutcheon, 8.
[37] Kac,18.
[38] Hutcheon, 10.
[39] Ibid., 4.
[40] Ibid.
[41] The poem and Kirke's instructions to readers/writers can be accessed at: http://wings.buffalo.edu/epc/ezines/brink/brink02/medical.html
[42] Hutcheon, 16.
[43] cf. Hutcheon, 28.

[44] Hutcheon, 20.
[45] Joyce, 112.
[46] Hutcheon, 9.
[47] Manovich, 16.
[48] cf. Hutcheon, 174.
[49] Details about "Storyspace" can be accessed at: www.eastgate.com/storyspace/StoryspaceOV.html
[50] cf. Hutcheon, 137-8.
[51] Joyce, 41.
[52] Polle T. Zellweger, Anne Mangen and Paula Newman, "Reading and Writing Fluid Hypertext Narratives" in *Proceedings of the Thirteenth ACM Conference on Hypertext and Hypermedia, 2002* (College Park, Maryland, USA, 2002, 45-54), 51. Retrieved on 25 May 2007, from: http://portal.acm.org/citation.cfm?id=513353
[53] Ibid.
[54] cf. Ibid.
[55] Ibid.
[56] On the potential of hypertext to change existing rules governing narrative structure, see David Kolb, "Hypertext as Subversive?" *Culture Machine*, accessible at http://culturemachine.tees.ac.uk/Cmach/Backissues/j002/Articles/art_kolb; George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Johns Hopkins University Press, 1992), and *Hypertext 3.0: Critical Theory and New Media in an Era of Globalization* (Johns Hopkins University Press, 2006); Joyce (1995); Jean Mason, "From Gutenberg's Galaxy to Cyberspace: the Transforming Power of Electronic Hypertext" (Diss.: McGill University, 2000), accessible at: http://www.masondissertation.elephanthost.com
[57] Nancy Kaplan, "Politexts, Hypertexts, and Other Cultural Formations of the Late Age of Print" (*Computer-Mediated Communication Magazine*, 2.3), 3. Accessible at: http://www.december.com/cmc/mag/1995/mar/kaplan.html
[58] Boyd and Richerson, 8; cf. Manovich.
[59] cf. Manovich.
[60] Tom Rocklin and James Rhem, "Gleanings on E-Mail Etiquette from Around the Net" (*The Virtual Companion: the National Teaching and Learning Forum* 9.6), accessible at: http://www.ntlf.com/html/sf/vc96.htm
[61] Lev Manovich distinguishes between "closed interactivity" (where readers play an active role in determining the order of already generated, fixed elements), and a more complex, "open interactivity" (where both the elements and structure of texts are either modified or generated on the fly in response to the readers' interaction with the programme), *The Language of the New Media*, 40.
[62] Hutcheon, 138.
[63] See Andreas Luco (1999), whose website features numerous other discussions dealing with the relationships between critical theory and cyberspace: http://www.cyberartsweb.org/cpace/theory/luco/Hypersign/Play.html
[64] Hutcheon, 137.
[65] Manovich, 42.
[66] David Jay Bolter, *Writing Space: The Computer, Hypertext, and the History of Writing* (Hillsdale, NJ: Erlbaum, 1991), 87.
[67] Mason.
[68] Ibid.
[69] Hutcheon, 4.