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From Machinic Intelligence to Digital Narrative Subjectivity: Electronic Literature and Intermediation as “form of life” Modification

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ABSTRACT

The paper first examines some of the ways in which identification of human/machinic intelligence with subjectivity as a philosophical construct has often been contingent on a cultural disjunction involving objective and subjective model-making that has long distinguished the two fields of science and the humanities. The second part of the paper proposes a rethinking of the subject/object dichotomy for selected narrative-based digital productions in order to assess their role in reconfiguring our ‘language use’-instantiated “form of life,” in the sense expressed by Ludwig Wittgenstein in his late philosophy.

Categories and Subject Descriptors

A.0 [General]: *general literary works*, H.1.2 [Information Systems]: User/Machine Systems – *human information processing, human factor*, I.2.0 [Artificial Intelligence]: General – *philosophical foundations*, J.5 [Arts and Humanities]: *literature, linguistics*.

General Terms

Algorithms, Performance, Design, Human Factors, Languages, Theory.

Keywords

N.K. Hayles, L. Wittgenstein, Storyspace, M. Joyce, J. Morrissey, interaction, literary artifacts.

1. INTRODUCTION

In his foreword to Alan Turing’s well-known essay “Computer Machinery and Intelligence” in *The New Media Reader*, Nick Montfort observes that Turing “offered [the essay] to the philosophers who read the journal *Mind*, not to computer scientists, as a way to challenge their notion of intelligence” [17]. As a matter of fact, the extensive range of intellectual perspectives from which the Cambridge mathematician approached the issue of intelligence in the article seems, in retrospect, hardly reducible to the subsequent specific research on symbols computation (now often referred to as GOFAI) for which Turing was implicitly providing such a foundation. As Luciano Floridi remarks, “the study of artificial intelligence (AI), in strict relation to psychological and physiological investigations of the nature of

biological intelligence and the philosophy of mind, represents the oldest area of contact between philosophy and computer science” ([3], p.18). In this interdisciplinary “contact zone” (crucial for our definition as human beings), realist and constructivist attitudes have not always been neatly divided along distinct methodological concerns. As Sam Williams suggests, “unlike their counterparts in the chemistry lab or the physics departments, A.I. researchers have found their efforts to break down intelligence into a few foundational precepts continually rebuffed” ([27], p.xiii). Metaphorically speaking, in the gray area of definitions of intelligence, science’s alleged incremental ‘knowledge building’ methodology is destined to meet the erosion of the recursive waves typical of ‘philosophical thought’.

In its tentative endeavour to interconnect machinic intelligence and literary subjectivity within the frame of a specific philosophical view, the present paper can be seen as an attempt to evaluate whether the recent appearance of selected literary artifacts developed out of aesthetic possibilities specific to digital/computational media might be characterized as another contribution to our understanding of subjective intelligence. In their reviving scholarly concerns for the way we, as language-using subjects, process information in relation to computer-based forms of representation, digital-born literary productions can be seen as cultural intermediaries between intellectual energies at play both in scientific labs and in the classrooms of humanities departments.

In “Intelligence without Representation” MIT scientist Rodney Brooks explained how to create artificial creatures without the encumbering tool of a preliminary abstraction process aimed at providing the machine with an elementary world representation. In Brooks’s terms usually “the abstraction is done by the researchers, leaving little for the AI program to do but search” [1]. The problem, in Brook’s view, is that such initial abstraction process, intended as preparatory world conceptualization/representation, *is*, in fact, the essence of intelligence. As a complementary observation, we can argue that literary artifacts, on the other hand, have long dealt – by definition and anthropological practice – precisely with forms of (either verbal or multimedia) representation produced by what we *ipso facto* assume as our prototype of intelligent subjects.

What happens, then, to our notion of subjective intelligence when, as in so-called second-generation electronic literary works

(Hayles), the abstraction process connected with world representation is partly delegated to digital machines via software, algorithmic, time-based, or expressive AI processes?

In distancing his theoretical premises from Heidegger's, Brooks explained that his work at MIT AI Laboratory was "based purely on engineering considerations. That does not preclude it from being used in philosophical debate as an example on any side of any fence, however." [1] What I would like to explore is whether the application of a particular philosophical frame to specific literary/compositional practices in digital media can be conversely used to reorient the technological debate as an example on any side of the fence.

Whereas, from Turing to Brooks, scientists frequently foreground philosophical concerns, there is more than one reason to ask whether contemporary new media studies, in their attempt to find operative vocabularies for the unprecedented "complexity" of the digital [13], might have reconfigured humanistic concerns under the rubric of scientific-based ones. The boundaries between the supposedly separate spheres of science and humanities are, in fact, being crossed more and more frequently in scholarly studies devoted to the analysis of various forms of digital literacy connected with recent technological developments in networked and programmable media. Such an overlapping takes place not only on the institutional level, but also on the methodological, conceptual and terminological ones. N. Katherine Hayles's leading-edge use of neurocognitive terms such as "dynamic heterarchies" in her literary analysis, Matthew Kirschenbaum's fruitful "close reading" of the hard drive medium storage, Mark Hansen's focus on the "haptic", "kinetic", and "proprioceptive" constituents of our "sensorimotor" perceptions in examining digital art are just a few recent examples of an increasingly complex relationship in contemporary new media studies between the objective and subjective model-making that, regardless of realist or constructivist concerns, has long characterized the distinctive *Modus Operandi* of the two fields.

Contrary to this convergent model, however, some conceptual polarities seem to regularly escape terminological readjustment. Despite according to Adalaide Morris, "the term 'cyborg' and, increasingly, the term 'posthuman' [...] hold open a place for configurations for which we have as yet only a tentative vocabulary" ([18], p.4), a fundamental dichotomy such as *subject/object* is still in place in digital literary studies. No matter how many attempts at (re-)defining the cultural productions emerging from the digital field, the frequency of expressions such as "digital objects" and the equally recurring "digital artifact" in referring to digital-born (text-based) compositions is pervasive at best. Noah Wardrip-Fruin's concept of the "textual instrument" [25], Matthew Kirschenbaum's idea of digital text as "material inscription" [11], Hayles's definition of digital-born literature as a "first-generation digital object" [6], and Michael Mateas's Expressive AI artistic "artifacts"¹ [16] can be seen as constituents of a theoretical constellation reflecting the persistence of an object-driven conceptualization model that has rarely been questioned in new media studies' scholarly contributions. Despite a remarkable number of highly relevant inputs on the issue², studies have rarely gone in the direction of either envisioning a subjective dimension for digital literary entities or privileging the subject-related semantic field in their terminological treatment of electronic literary works.

2. DIGITAL NARRATIVE SUBJECTIVITY

Interactive affordances in digital narratives have scarcely ever been conceived of as a form of philosophically-grounded textual *subjectivity*. Rather than as potential attempts to simulate virtual narrating subjects in a literary context, electronic literary works (often using algorithmic-based or time-based expressive modalities) have either undergone object-oriented conceptualization models ([25], [11], [16] and others) or regarded as systemic components in distributed human/machinic cognitive processes ([6], [7]).

As Noah Wardrip-Fruin explains in his introduction to Norbert Wiener's "Men, Machines and the World About", before cybernetics, machines were conceived and analyzed as isolated objects defined in terms of "mechanics, differences of power and voltage, observable physical changes" [26] but once the study shifted to the analysis of structures and regulatory systems, the scientific-based scrutiny could equally be applied to the physical and to the social environment. In other words, cybernetics "created a framework for studying communication and control systems that spread across multiple entities" [26]. As a result, the new type of study introduced by cybernetics had a significant role in undermining the stability of humanist ideas on subjectivity causing the "ongoing transition from the traditional liberal self to the contemporary posthuman subject" ([8], p.2). The process would obviously affect the posthuman subject's literary representation in terms of narrative voice to the point that, in commenting on Robert Coover's decision to abandon electronic literature practices, Hayles – or better in her persona "Kaye" in *Writing Machines* – "could see that if voice was what mattered most to you, second-generation electronic works generally had less of it than first-generation texts and so from this perspective could be seen as a decline. It came down, she realized, to a question of what constituted literature" ([7], p.45). In evaluating the retrospective effects of digital-born artifacts on our vision of literature as a whole, Hayles justly argues that, before the renovated focus on materiality encouraged by digital literary productions, "with significant exceptions, print literature was widely regarded as not having a body, only a speaking mind" ([7], p.32). This consideration, however, draws implicit attention also to the complementary perspective according to which, despite Raymond Kurzweil's characterization of digital machines as currently on their way to reach the 20-million-billion-calculations-per-second capacity of the human brain, evolution of computer machinery has rarely been regarded as the growth of more and more compelling "minds", but mostly as the updating process of the machine's chip-based body. As a way to network between renovated attention to the body of literature (inscriptional object materiality) and to sensational-sounding appraisals of computers' dynamic "cerebral" performance, I believe Ludwig Wittgenstein's late philosophical work provides a suitable frame to elaborate a process potentially leading to the envisioning of a digital textual subjectivity for digital born literary works and, ultimately, to the conceiving of electronic narratives as literary post-machinic subjects. This is mainly an outcome of two main features of Wittgenstein's late philosophical work, one theoretical the other formal. On the one hand, the fact that many a critic has stressed how Wittgenstein builds up a "community account" of the mind³ makes his remarks particularly suitable to be put in conversation with the foundational work on distributed cognition in digital environments provided by Katherine Hayles. On the other hand, the loose character of Wittgenstein's philosophical observations in

his late writings leaves open space for intellectual explorations beyond the limits of any rigid philosophical system possibly dealing with the so-called ontology of the digital. As Søren Overgaard notices, Wittgenstein usually “engages in dialogues with various imaginary or real interlocutors, and the point of these dialogues is not primarily to promote a set of fixed philosophical claims ... He is not trying to foist a particular view on us as much as he is trying to get us to think carefully about certain philosophical issues. To be sure, the point is usually that we need to think *differently* about the issue at hand [...]” ([20] p.3)

First, according to Wittgenstein, there is no actual philosophical need to envision a metaphysical locus where meaning and thought must reside as a necessary pre-condition for language-based interactions aimed at meaning production. Much as electric polarities-based digital responses, Wittgenstein’s theory of language games does not rely on the hypothesis of a locatable “speaking mind” able to perform thought processing in the absence of language (i.e. before actual behavioural-based language manifestations). Secondly, although he uses the term only a few times in his written work, crucial developments of the *Philosophical Investigations* stem from his idea that “the speaking of a language is part of an activity, or of a *form of life*⁴[emphasis added]” ([29], §23). Wittgenstein thinks about speaking as rule-guided activity. In his view, our language games are interwoven with non-linguistic practices in a totality which is at the same time both contingent and embedded in them. In other words, language has no essence, but is made of various phenomena multifariously connected in a texture of family resemblances ([29], §67). As he points out, “I shall call the whole, consisting of language and the actions into which it is woven, a ‘language-game’” ([29], §7) and he explains that “to imagine a language means to imagine a form of life” ([29], §19).

As responsive literary devices involved in language-based linguistic and extra-linguistic practices, it is worth asking how digital narratives partake in reconfiguring our rule-guided intersubjective behaviours at the level of literary negotiation. In other words, since technotexts “mobilize reflexive loops between its imaginative world and the material apparatus embodying that creation as a physical presence” ([7], p.25), to what extent does any interaction with a dynamic technotext or interactive digital literary artifact also reconfigure the range of language-use instantiated practices in/on which our form of life is, in Wittgensteinian terms, embedded and contingent? For the purposes of this paper we can limit our brief analysis to those language practices already in a family-resemblance relation with our rule-driven language games of “reading” and “writing”.

In “Hypertext Fiction Reading: Haptics and Immersion” Anne Mangen suggests that digital media are changing the common practice of what we call reading by emphasizing the vital role of our bodies (in particular fingers and hands) in our reading/scanning experience of the physically ‘untouched’ digital text [15]. To have a clearer idea of the possible reconfigurations of our language games connected to reading and writing, let us consider the example Wittgenstein provides about the difference between a human reader and a hypothetical “reading-machine which translated marks into sounds, perhaps as a pianola does”. In this case

“it would be possible to say: ‘The machine *read* only after such-and such had happened to it – after such-and-such parts had been connected by wires; the first word that it read was...’. But in the

case of the living reading-machine “reading” meant reacting to written signs in such-and-such ways. This concept was therefore quite independent of that of a mental or other mechanism” ([29] §157).

Wittgenstein shows in the example how what we call ‘reading’ in either case is an instantiation of very different rule-guided language games because certain sentences happen to be used rather than others (see [29], §§156-181 on the difficulty of establishing reading’s first occurrence in human reading). Shifting such considerations to the process of writing, it is possible to notice how, unlike printed texts, dynamic and time-based digital texts, for example, make the use of language expressions such as “the work shows the first words after such-and-such has happened” or “it immediately encourages/allows/prevent the reader to/from” make sense rather than the use of sentences like “the reader can open the work on such-and-such passage” or “now turn the text upside down”. In other words, in the dynamic digital environment the propositions we frequently use for oral or real-time subjective storytelling implicitly take the place of expressions used in object-oriented language games typical of printed texts. To consider such sentences as working not only as empirical propositions but as ‘grammar proposition’ (sentences that, in Wittgenstein’s terms, express a rule) is contingent just on whether we use them as standards of correctness, i.e., as Hans-Johann Glock puts it, if we use them “normatively to explain, justify and criticize uses of words” ([4], p.152). In other words, as he goes on to explain, “the logical status of a sentence is due not to its linguistic form but to the way it is used and can hence change” ([4], p.155). Often times the narrative itself seems to ‘cry out’ for forms of interactions we usually reserve for subjectivity-endowed entities. Hayles’s discursive treatment of Michael Joyce’s *Twelve Blue*, for example, as a narrative requiring readerly behaviours carried on “with an intention to savor rather than attack or master it” ([6], p.64) implicitly calls attention precisely to internal relations’ rule-shifting in language games connected to our common use of textual inscriptions. In philosophical terms, as Wittgenstein highlights, “any empirical proposition can be transformed into a postulate – and then becomes a norm of description” ([28], §321). If we do not use (yet) propositions like “it types words for you” for time-based electronic narratives or “it is thinking about the next chunk of the story” when a narrative pause occurs (but also when the work’s screenshots become, for example, unresponsive) it is because, in Wittgenstein’s terms, we could regard typing out symbols on a screen as “thinking” only if we dealt with an entity for which we can envision a larger range of behavioural properties. We would therefore also need to evaluate to what extent such an “envisioning” process might be carried out for digital narratives.

3. TWELVE BLUE AND THE JEW’S DAUGHTER

In “Locating the Literary in New Media” Joseph Tabbi makes the point that although most critics dealing with digital literary productions analyze works produced in North America and although such works “embrace quite a diversity of topics, formal approaches and media,” ([23], p.323) they rarely present their work under the rubric of American literary studies. American literature, as a matter of fact, has often explicitly relied on the subject-page identification both for aesthetic and metaphorical purposes. “Camerado! This is no book; who touches this touches a man” Walt Whitman would warn his readers before they could

flip through his *Leaves of Grass*. From Whitman's celebration of the autonomous self to Toni Morrison's postmodern dis(re)membered one in *Beloved* to Richard Powers's posthuman representation of the author-protagonist construct in *Galatea 2.2*, literary representations of the subject have frequently drawn attention to the symbolic merging of text and flesh. The issue has often also leaked into the representation itself. Ray Bradbury's *Fahrenheit 451*, for example, features a conception of the literary work which is far from the idea of an object we merely dispose of. In the novel Bradbury symbolically suggests that, in order to survive, literature will have sooner or later to be transformed into something else: men shall have to literally "become" books. Our digital technology today seems to encourage conversely the opposite process by allowing us to create – via guard links, adaptive hypertext research, time-based processing, Expressive AI – metaphorical 'textual organisms' that react to human stimulations.

Along this suggestive developmental path *Twelve Blue* by Michael Joyce and *The Jew's Daughter* by Judd Morrissey and Lori Talley can be singled out as significant intermediate links in the evolutionary chain. Although relatively dated as text-based digital narratives and in many ways reminiscent of print culture's characteristic features when compared to more recent experiments in digital textuality, these works can be seen as unconventional forms of procedural literature whose attributes seem to encourage patterns of reaction potentially beyond strictly object-targeted interactions. It is, in other words, possible to briefly sketch some of the ways in which such works can be seen as indeed engendering an inherent subjective conceptualization.

First of all, both works visually offer themselves to the reader as organic entities interweaving permanence and mutability. Both graphic interfaces, for example, present the reader with the possibility of seeing each work in its entirety. The graphic outline of coloured threads constituting *Twelve Blue*'s initial screenshot is, in fact, the whole narrative. Impenetrable to the reader in its graphic form, the narrative only waits to be probed by the reader by means of progressive interrogation of its various sections. A similar dynamic is at play in *The Jew's Daughter*. The main screenshot – reductively titled "page" – provides, as a matter of fact, the whole narrative content as potentially *already there* for the reader to be gradually requested by repeated mouse-based 'brushing by'.

This comprehensive structural posturing is not limited to the visual surface but can also be found at the level of narrative voice. Both works deal with setting up an evocative narrative atmosphere in which, rather than specific fictional characters, the digital texts themselves seem to enact the main narrative voices. Hayles highlights how "entering the flow of the screen narrative" in *Twelve Blue*, "one cannot help noticing how difficult it is to identify the characters. Pronouns abound while proper nouns appear sparsely, teasing the player with ambiguities and arousing the desire to probe more into the work" ([6], p.66). Similarly, in *The Jew's Daughter*, according to Lori Emerson, "one can see that the references to the activities of 'she,' 'I,' and 'you' result in an indeterminate text that is not particularly about anything" ([2], p.71). In other words, rather than consistently relying on a definite story built by separate narrative perspectives (a paradigm to which modernist works have in many ways made us accustomed), both works seem to show how their textual frame is pervaded by a narrative language in which pronouns are nothing more than

provisional and interchangeable formal landmarks. Such reconfigurable narrative chorus, in exploiting the disarticulated narrative modalities provided by the digital environment, often intrude the meta-textual level making possible to interpret words *in* the text as words offered *by* the text. In Morrissey-Talley's progressive reconfiguration of the page often times words in themselves do not actually change; only punctuation does. Syntax changes, then, implicitly transform what were previously statements into questions and what were previously questions into indeterminate reconsiderations.

In other words, sentences become different *behaviours* or, in Wittgensteinian terms, distinct moves within different language games regulated by different rules. It is not difficult to put this feature side by side with the consideration that most of *Twelve Blue*'s content is offered via an hesitant sentient-simulated narrative behaviour. The reader is frequently left only with hyperlinked three-dots suspension pauses: a suggestive equivalent of moments of silence requiring sensitive inter-subjective (literary) negotiations. Readers can ask the narrative to 'tell more' or decide to interrogate the cognitively more enigmatic graphic segment represented in the left margin of the screen – a language-game difference conceivable in terms of the difference between reading alphabet symbols and 'reading between the lines' of the work's graphic expression.

Moreover, these digital narratives at times explicitly *do* speak to the reader. "Follow me before the choices disappear" communicates *Twelve Blue*, with a fatality typical of existence itself (at least within the time frame of the single reading session). What matters most, in fact, is that the sentence inevitably keeps its promise by visually hiding the link in subsequent encounters with the same lexia. This is no isolated case. The sentence "You could never imagine a woman sleeping next to him. Moon flowers," for example, leads to the linked "In the blue mirror of your eye, moaning" in a sequence of disappearing links reminding of evocative whispered explanations – at least until you reach the overtly scornful "God damn them all". Likewise in Morrissey-Talley's work, as Lori Emerson again suggests, "the 'you' could be both reader and writer" ([2], p.71) so that the audience can be in many a passage assumed as the legitimate subject addressed by *The Jew's Daughter*'s words. Words placed in isolation at the centre of the page such as "I fall to pieces each time I see you again" ([19], 140) fit particularly well the kind of reading interaction the work is supposed to encourage. In addition, as a digital virtual storyteller, the work even reveals to the reader *secrets* about its own nature. On screenshot 24, *The Jew's Daughter* offers as a viable link only a parenthesis, something that potentially invites the reader either to go beyond cognition level (to interact with a typographic symbol has roughly the same rule-following indeterminacy of interacting with a visual thread of yarn in *Twelve Blue*) or to receive from the text the implicit suggestion that you have, in fact, been wandering *within* a textual sublevel thus far (i.e. to use the typographic sign as a signal of hierarchical layer, something for which parenthesis are commonly used in our reading conventions). Even more suggestive is the "pages" gap between screenshots 34 and 135. Besides the implicit expressive allusion to the unusual/deviant rule-following occurrence in a mathematical sequence (repeatedly discussed by Wittgenstein in various works), the 'jump' results in a parenthetical sequence of words "typed" in real-time on the screen before the eyes of the reader. The passage content refers to a decapitated female body and the numerous typing errors, together

with the unexpectedness of the textual event itself, suggest the symbolic occurrence of a (digital, subjective) trauma in an otherwise plain narration. It is no surprise, in fact, that both works seem to ask for *sensitive* interactions. As Hayles remarks before beginning her critical investigation of Joyce's work, "like sensual lovemaking, the richness of *Twelve Blue* takes time to develop and cannot be rushed. Let us begin, then, with a leisurely embrace that wants to learn everything it can about this textual body" ([6], p.64). What Hayles is ascribing to *Twelve Blue* is a fascinating, alluring subjectivity able to stimulate the negotiation of literary information in ways that go well beyond the mechanic clicking-equivalent of page turning.

Advocating a need for forms of interaction different in kind from the ones relatable to an object's mere disposal does not mean to discover specific attributes able to qualify the narrative as eligible to 'special' treatment. It rather means to assume a stance toward storytelling that privileges meaning as *inter-subjective* in its use-based and use-regulated practice involving both linguistic and extra-linguistic elements. In Overgaard's terms the issue is more of an ethical nature than of a hermeneutic one: "to recognize someone as another human being is not merely to discover certain features of an object; it is, rather, something that is already interwoven with characteristic attitudes and normative patterns of reaction" ([20], p.9) (i.e. in our case the ones typical of human-to-human relationships). This is why *Twelve Blue* and *The Jew's Daughter*, from this point of view, can be conceived of as machinic storytellers asking for behavioral strategies and literary negotiations. In so doing, they remarkably multiply the rules defining our language games of reading and writing and therefore rearrange the shifting patterns of reaction constituting our language-use based form of life. Their unavoidable connections to the pre-existing object-like modes of print as (digital) literary *productions* should not overshadow their procedural and temporal potential for (both human and machinic) performance reconfiguration. Lori Emerson makes clear that Morrissey-Talley's work, for example, in its reworking the bookbound page, nonetheless offers the reader a certain degree of stability: "with only one mouse-over on each page, the text can only change in one pre-determined manner at a time" ([2], p.72). In Wittgenstein's terms, however, what is decisive about rule-following is not the occurrence of many encounters with different and ever-changing subjects, but the many different occasions in which the rule-following performance is required. In suggesting that these selected works allow for 'form of life' modification, I imply that this is made possible precisely by the alleged stability provided by their apparent nostalgia for the page-based format. In other words, conceived of as interactive subjects, the digital narratives I chose as exemplary embryonic representatives of digital narrative subjectivity are not too 'alien' from what we culturally count as books. This does not prevent them, however, from encouraging interactions able to displace the settled grammar conventions of our interactions with 'writings'. The paradoxical dynamic in *The Jew's Daughter*, for example, is that the search box tool is likely to appear to the reader as both plausible and incomprehensible at the same time – at least from the point of view of a narrating subject conceptualization. Though it allows the reader to directly jump to a particular page, the search box can probably be useful only for re-reading purposes. Therefore, whereas asking for occasional repetition can most of the times be seen as a legitimate practice in oral storytelling-related language games, hardly anyone would ask a storyteller to jump at some random point forward in a story – unless, of course,

someone would be willing to engage in a playful narrative game that would anyway no longer count as 'reading'. Considering such entities either as literary digital objects or as narrative post-machinic subjects is contingent, rather than on any pre-defined ontology of the digital, on the extent to which we allow them to change grammar propositions (sentences that express a rule) governing our language games of reading and writing. As Wittgenstein himself puts it, "Essence is expressed in grammar" ([29], §371) and grammar sanctions "what kind of object something is" ([29], §372).

4. LANGUAGE GAME INTERMEDIATION

These examples give a sketchy idea about how by reframing subjective/relational interactions within philosophy of language's concerns we might start to think of specific digital texts as computerized simulations of virtual narrating subjects participating in the rule-reconfiguration of some of the specific language games that define our form of life. As Marie-Laure Ryan points out, "computer simulations... are processes and not objects; ...they are not supposed to re-present what is but to explore what could be" ([21], p.63). Similarly, in envisioning "powerfully evocative new narrative forms" that take advantage of specific characteristics of computational media, Fox Harrell mentions, among other characteristics, precisely "dynamic execution", "polymorphic representation" and "user feedback channels" [5]. Future research on guard fields, adaptive hypertext and time-based and/or algorithmic processes can, in the long run, culturally reorient creative technological efforts towards the realization of digital literary works able to be nearer to the dynamic and process-like aspects of human existence than electronic non-linear objects have been thus far. But this is unlikely to happen in the absence of a reconfiguration of the theoretical frame within which such creative digital practices might take place.

When Hayles writes that "to change the material artefact is to transform the context and circumstances for interacting with the words, which inevitably changes the meaning of the words as well" ([7], pp.23-24), she is making a significant step in the direction of re-envisioning meaning as shifting from the hermeneutic to the so-called pragmatic dimension. If meaning change depends on the circumstances of interaction, what is changing – in Wittgenstein's terms – is the "use" of the words characterizing a particular language game and, in its own turn, the whole family-resemblant language game texture. Hayles's treatment of the specific transformative processes that electronic literature is able to produce on its readers (through the recursive feedback loops "connecting bodies and machines, natural language and code, human and artificial intelligence" ([6], p.119) offers an image of the corpus of digital literary works as partaking in the creation of intermediating dynamics connecting systems "at different levels of complexity, the human being immeasurably more complex than the computer" ([6], p.47).

In explaining how interaction with digital computational devices results in a "reengineering" of the human user, Hayles is undoubtedly correct from the Wittgensteinian perspective as far as language use practices are concerned. In envisioning "the human and the digital computer as partners in a dynamic heterarchy bound together by intermediating dynamics" ([6], p.47), Hayles makes clear that the intermediation cycle works for electronic literature's reading as well as writing. Particularly interesting in

this case is the writer's experimentation within the medium possibilities as interwoven with the continual testing process of the executable files. The process can, in fact, be conceived of as a language game-based behaviour constantly contingent on rule-following occurrences. Wittgenstein's famous argument against private language, according to which "it is not possible to obey a rule 'privately': otherwise thinking one was obeying a rule would be the same thing as obeying it" ([29], p.202) inherently makes electronic literary works into (subjective) entities partaking in the establishment of what one is stage-after-stage *capable of doing* (we should not forget that, rather than a mental state, understanding is for Wittgenstein primarily the mastery a technique). As a result, Hayles is again correct in stating that "the computer can function as a partner in creating intermediating dynamics in ways that a book cannot" ([6], p.58).

If the "intermediation" relationship between human and computers suggested by Hayles as a frame for the understanding of electronic literature is part of the coevolutionary stance spiral between body and technology, we can expect it to produce thinkers more prone to ascribe part of the subjectivity domain to those technological entities that have (and have had) a primary role in shaping us as humans, i.e. in shaping the specific language games that, in Wittgensteinian terms, defines us as a distinct "form of life". As Hayles points out, "once coevolution begins, both partners are bound in cotemporal recursive cycles with one another" ([6], p.108). What Wittgenstein's *Weltanschauung* allows us to by-pass is the logical node implicit in the fact that if coevolution "begins", we should rationally imply that there was a prior time in which one of the two was a primary factor. Wittgenstein's late philosophy, however, postulates that the foundations of human language are to be found, not in the metaphysical logical space of possible situations (foundational to his previous views as expressed in the *Tractatus Logico-Philosophicus*), but in the shifting patterns of intermutual activities performed by users. The multiplicity of language games "is not something fixed, given once for all; but new types of language, new language games, as we may say, come into existence, and others become obsolete and get forgotten. (We can get a *rough picture* of this from the changes in mathematics)" ([29], §23). This is why it is precisely in their allowances for interactions with dynamic systems requiring us to perform language-based behavioural strategies across a wide range of rule-following occurrences (included malfunctioning) that electronic narratives can legitimately be considered as post-machinic subjects, viz., as legitimate participants in reconfiguring our concrete uses of language-based practices.

5. CONCLUSION

Regardless of essentialist considerations, Turing's conclusions in "Computer Machinery and Intelligence" mainly dealt with linguistic concerns. His beliefs were that "at the end of the century *the use of words* and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted [emphasis added]" ([24], p.55). The possible establishment of the idea of machines as subjects endowed with intelligence was, in other words, primarily related to the issue of settled linguistic conventions. As I have argued, within a specific philosophical frame, it is possible to re-conceive of electronic narratives as subjective entities operating at the intersection of our notions of machinic and mental life. If Johns Johnston argues that "machinic life, unlike earlier mechanical

forms, has a capacity to alter itself and to respond dynamically to changing situations" ([9], p.ix) and Overgaard argues that "expressed" mental life is contingent on "the variability and dynamics that are characteristic of expression" ([20], p.8) (in which such "dynamic has 'another subject' as its source"), my brief analysis of selected digital narratives (Judd Morrissey's *The Jew's Daughter* or Michael Joyce's *Twelve Blue*) offers a reading of digital literature as potentially fulfilling both perspectives. Building on Wittgenstein's conception of cognition as "world-involving, embodied and expressed" [20], it is possible to envision digital narratives as entities endowed with intersubjective principles of accessibility and mutual reconfiguration. Far from either antropomorphizing digital "relational artefacts" (Sherry Turkle) or implying any complementary process of computationalizing the human, the conceptual shift I am envisioning for digital narratives aims at providing a possible further shift for the paradigm of the "posthuman": not only from its connotation "as an apocalyptic erasure of human subjectivity" to "a positive partnership among nature, humans, and intelligent machines" ([14], p.xvii) as Tim Lenoir describes it, but also toward a greater attention to cultural affordances of the "post-machinic".

6. ENDNOTES

¹ In "Expressive AI: A Hybrid Art and Science Practice", however, Michael Mateas proposes the "conversation metaphor" to conceptualize artistic practice as "conversation between artist and audience mediated by the art 'object'" (150). Mateas specifically clarifies that "the object can be something non-concrete, such as a performance".

² See Katherine Hayles's "The Time of Digital Poetry: From Object to Event" in *New Media Poetics* or Mark Poster's *What's the Matter with the Internet?* where, however, rather than to the re-conceptualization of the object, the analysis of the "man/machine, subject/object, body/mind and time/space" couplets mainly goes in the direction of "a new configuration of the subject" (6).

³ See Meredith Williams' *Wittgenstein, Mind and Meaning: Towards a Social Conception of the Mind*.

⁴ For a treatment of the problem of "form" or "forms" of life in Wittgenstein's oeuvre see Krkac, K., and Lukin "Forms of Life as Forms of Cultures" in *Philosophy of the Information Society 30th International Wittgenstein Symposium Proceedings*.

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