Library Progress International
Vol.43 No.2, Jul-Dec 2023: P. 25141-25145

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article

Available online at www.bpasjournals.com

Cognitions in Creation: Unraveling the Evolutionary Interplay of Cognitive Assemblages

Dr. Tania Mary Vivera[1],Dr. Preeti Kumar[2]

[1].Assistant Professor, Department of EnglishSt. Teresa's College, Ernakulam, Kerala
[2].Assistant Professor, Department of EnglishSt. Teresa's College, Ernakulam, Kerala

How to cite this article: Tania Mary Vivera, Preeti Kumar (2024) Cognitions in Creation: Unraveling the Evolutionary Interplay of Cognitive Assemblages. *Library Progress International,* 44(3), 25141-25145

Abstract

Akin to cultural evolution, digital culture is amenable to replications, appropriations and transformations that reverberate the rapid advancements in technology. Literary artists have experimented upon digital platforms leading to an upsurge in electronic literature that portray literary creations in the digital arena blending the characteristics and cognitions of the literary mind and the digital world. In her study of electronic literature, Katherine Hayles (2016) proposes cognitive assemblage characterized by the distribution of cognitions amongst the humans and machines where meanings and codes are assembled and shared multidirectionally. The digital text chosen for study is *Evolution* (2014), an electronic work in progress that emulates the texts and music of the poet Johannes Heldén and features digital text that regenerates unceasingly. The evolutionary modeled algorithm rhythmically replaces Heldén's words and textual spaces with similar words/spaces generated algorithmically and will continue to do so until all of Heldén's original words are replaced in which case it will evolve its own constructions, thereby cognising its own creation. This study explores the possibilities of cognitive assemblage in *Evolution* that problematize the notions of authorship consciousness and cognitions behind the literary creation and examines the cultural transformations that are inevitable when the humans and the machines co-create the cultural and artistic/literary spaces.

Keywords: cognitive assemblage, technical cognition, non conscious cognition, digital poetry

Introduction

Cognition is an extensive entity that transcends thought and consciousness. Consciousness occupies a crucial position in our thinking not because it is the whole of our world of cognition but because it directs us to make sense of the world around us. In *Unthought* (2017) Katherine Hayles defines cognition as a "process that interprets information within contexts that connect it with meaning" (22). For her, the crucial distinguishing characteristics of cognition are "choice and decision" (28) which open up a world of possibilities, interpretations and meanings and this definition enables the distinction between cognizers and non cognizers. Cognition is pervasive in humans and other life forms and non life forms such as technical systems governed by artificial intelligence and non cognition is the trait of inanimate forms. Additionally, "nonconscious cognitions" (10) represents the cognitive capacity that works beyond the level of consciousness and are essential to human experience, biological life and technical systems. It operates at a level of neuro processing that is inaccessible to consciousness yet affect the conscious operations. Inferential discernment, coding complex patterns, processing the flood of information that passes through the brain and prioritising their demands are some of the functions performed by the non conscious cognition. Understanding non conscious cognition will pave the way to a more balanced study of human mind, other biological cognizers and the cognitions of technical systems that are built to mimic human minds. It is imperative that cognition is studied not just as a human capability but as a means to understand the enmeshed realm of biological and technical cognition. A central implication of Hayles' work is her critique of the Cartesian dualism that separates mind from body, a model she contends is insufficient for comprehending cognition in the

context of the digital age. She proposes, instead, an embodied model of cognition, wherein thought processes are distributed across the brain, body, and the digital ecosystems that surround and engage them. This approach aligns with her broader conceptualization of cognition as inherently relational and ecological, transcending the traditional boundaries of individual human thought and extending into intricate networks that encompass both human and non-human actors. By emphasizing the interdependence between cognition and digital environments, Hayles suggests a paradigm that redefines cognition as a collective and integrated phenomenon within a techno-human assemblage.

Akin to human nonconscious cognition, technical cognition supercedes human consciousness in drawing inferences, detecting pattern and classifying complex information and works with massive informational streams that are beyond the cognitive capacity of human cognition. The evolution of technical cognition and the parallels between human and technical cognition is not unplanned, but rather a result of the exteriorization of human cognitive abilities onto technical, non human intelligences and the rapid transformations that resulted from the enmeshed cognitions. It is inadvertent that the cognitive entanglement has evolved and transposed to such an extent that is difficult to discern one from the other. According to Hayles, these distributed cognitive systems work as cognitive assemblages that "operate through contextual relations at multiple levels and sites, with boundaries fluctuating as conditions and contexts change." (33). A cognitive assemblage is a distinct kind of network that is characterized by the shifting configurations between human and technical cognizers that intersect and interact incessantly to generate unique and novel schemata of information that is customised to the requirements and demands of the system. However, these assemblages remain unpredictable and erratic due to the nexus of humans and technical systems; "the cognitive decisions of each affect [ing] the others" (118). In this realm of non conscious cognitive assemblage, the cognitions work in collaborative schemata where the technical and the human cohabit and are in symbiosis. Cognitive assemblages involve information transactions across multiple membranes of voluminous entities that network and evolve incessantly. In a cognitive assemblage the human and technical systems are constantly at labor, adaptive to exigencies, mutating on demand, and evolving novel pathways of information exchange that are hitherto unknown. Because of the fuzzy networking involved, it is impractical to specify the cognitive processes involved and trace their distinct pathways.

Cognitive assemblages are chartered, developed, and augmented through intricate multilevel interactions between human and technical cognitive processes. These interactions undergo continuous mutation as they engage in tasks such as information gathering, processing, communication, evaluation, and storage, thereby contributing to the evolution of the cognitive assemblage. As the cognitive load and demands escalate, this assemblage advances towards a state of cognitive autonomy, wherein technical systems gain the ability to function independent and disengaged from their human counterparts. The incorporation of technical mediations in the cognitive domain leads to a reconfiguration of traditional discursive frameworks and cultural practices that have long been intrinsic to human societies. Consequently, novel adaptive strategies and innovative hybrid cognitions emerge, demonstrating their distinctive characteristics, effectively branching out and independent of their origins. The intricate interplay amongst the hybrid cognitions engender a series of possibilities, challenges, and haphazard systems, culminating in a capricious and inevitable trajectory of cognitive disarray.

Hayles' arguments are profoundly resonant with Clark and Chalmers' (1998) foundational work, "The Extended Mind", which reconceptualizes cognition by challenging traditional, brain-centric models. Clark and Chalmers propose that cognitive processes are not solely internal but extend into the environment through interactions with external devices, tools, and material contexts. The external technical tools become functionally inseparable from mental processes, facilitating and even restructuring cognitive abilities such as memory retention, spatial awareness, and problem-solving capacities. In this model, cognition is inherently adaptive and intimately bound to the physical and technological milieu in which it occurs. The boundaries of cognition are therefore fluid, with external resources dynamically integrated to form an extended cognitive apparatus. This shift in cognitive architecture redefines cognition as an adaptive system, with external devices functioning as constituent elements of the cognitive process.

Building on this framework, Gallagher (2017) advances an enactivist approach in *Enactivist Interventions: Rethinking the Mind*, foregrounding the role of embodied interactions within the environment as foundational to cognitive processes. Gallagher argues that cognition is enacted through active, sensorimotor engagement with the surrounding world, asserting that cognitive processes are relational and context-dependent rather than solely located within the individual mind. Gallagher's enactivism aligns with Hayles' concept of distributed cognition,

underscoring the notion that cognitive agency is not isolated but is instead an emergent property of dynamic interactions within networks that encompass both human and non-human agents.

In *The Post Human* (2013), Rosi Braidotti explores cognitive assemblages within the framework of Posthumanism and challenges the traditional understanding of cognition as solely residing within human minds. Cognitive assemblages acknowledge the agency of non-human technical entities that simultaneously transforms and influences human cognitions. The interconnected assemblages foster a posthuman understanding of subjectivity and knowledge production and foregrounds ethical implications that urges responsible engagements with technology. Furthermore, she argues for a critical rethinking of the life-death distinction, proposing instead a vibrant continuum redefined by internal distinctions. This reimagining moves us away from both individualism—toward an embrace of complex, interconnected entities—and anthropocentrism—toward an appreciation of the diverse, non-human forces and technical assemblages that are perpetually reshaping our world (139).

In the realm of technology, digital media is all pervasive, deeply interwoven with human cognition and permeates various facets of social and cultural practices. Within the domain of digital writing, a symbiotic relationship between writers and technology emerges, challenging established notions of authorship and prompting inquiries regarding identity, creativity, knowledge, choices, and selections. Consequently, the computer plays a collaborative role in the artistic creation process. Nevertheless, the distinction between technical and human collaborators becomes increasingly ambiguous; yielding a hybrid product of enmeshed cognitions that resists clear attribution to individual contributors. For instance, the programming dynamics of generative digital poetry works on algorithmic randomization and the resultant cognitive assemblage is both creative and volatile. However, the creative literary content opens itself to duplication, encapsulation, appropriation and randomization that are independent of its parent cognitions; bringing in an ontological diversity of agency and cognitive fluidity.

Digital narratives thriving under the favorable ontological fluidity of the digital world is the ideal playground for authors experimenting on generative poetry that collates the cognates of the technical and the human. Here the computers are the symbionts, facilitating and enabling creative practices that could not exist in their contemporary forms without their ideal intervention. The synergy of cognitions is upgraded further in *Evolution* (2014), a collaborative digital work by poet Johannes Heldén and Håkan Jonson, who have programmed the computer to perpetually erase and overwrite the original words of Heldén. The work is a collaborative venture of the visual artist Heldén, the computer programmer Jonson and the algorithmic musings of the computer program. In the preface the authors have commented that the "ultimate goal" is to surpass the Alan Turing's Imitation Game when the algorithm generates new poetry that resembles the work of the original author, yet dissimilar. Here, the programmer and the author are indistinguishable and their cognitions are abdicated to the non human cognitions at play (*Evolution* 2014). This study critically investigates *Evolution* for its nuanced application of the concept of cognitive assemblage. *Evolution* exemplifies how cognitive assemblages operate as networks where human, non-human, and technological elements interact dynamically to foster new modes of comprehension and expression, evolving nodes that were hitherto unexplored.

In this framework, *Evolution* transcends the traditional notion of poetry as a static artifact, positioning itself instead as a living, adaptive entity that embodies the interplay of diverse cognitive agents. Heldén and Jonson employ generative algorithms and interactive functionalities to facilitate active reader engagement in the narrative process. The resulting cognitive assemblage underscores the fluidity of authorship, as readers not only interact with the text but also contribute to the shaping of the poetic landscape, thereby becoming co-creators of meaning and experience. The functioning of the *Evolution* program reveals the conceptual and ontological scaffolding of cognitive assemblage. In the 2014 version, the authors input into a database all ten of the existing print books of Hélden's poetry. The textual corpus is then structured based on the Markov Chain, which operates step by step through the data, gradually replacing the content based not on its past states but on its present state. The subsequent genetic algorithms work as per evolutional model that selects the best output that closely emulates Hélden's style and lyrical practices. The design of the algorithm ensures that even white spaces, that are meaningful elements in the digital text, can be replaced or modified.

The digital text *Evolution* is presented as an interactive, open book with a light grey background. On the left page, the viewer can choose between Swedish and English languages and control the speed at which the textual changes occur using a slider. The right page displays the evolving digital text in real-time, with flashes of white rectangles indicating the ongoing mutation process. The text continuously unfolds and evolves right before the viewer's eyes, justifying its name, "Evolution." Each time the page is opened, it starts with one of Hélden's poems selected

randomly as a starting point. The text then evolves at the speed set by the user, and a generation number at the bottom records the sequence of iterations. The dataset used for the evolution is a random selection from eighteen different datasets contributed by the creators. This dataset is a playful mix of various information including terrestrial, astronomical and cultural data symbolizing the universality of the evolutionary process. Accompanying the evolutionary digital text is an eerie audio generated in real-time from Hélden's compositions. The ambient soundtrack is unique for each view, randomly selected and mixed from an audio database, augmenting the evolutionary design of the text. The textual evolution continues as long as the page remains open, with each of Hélden's original words being replaced algorithmically. The text has no fixed beginning or end, as the replacement process goes on even after all of Hélden's original words have been replaced. The program will continue to recreate the text, shifting from collaborator to creator, algorithmically evolving without human interference. The program expands its knowledge base and become flexible and adaptive, much as biological brains learn.The interactive digital text *Evolution* showcases a stage of cognitive autonomy where the technical systems and cognitive functioning have transitioned from human control to non-human, independently evolving in the digital realm. It reflects the dynamic and transformative nature of cognitive assemblages and the evolving, autonomous nature of generative digital text.

In addition to being available online, the work is also presented in the form of a limited edition print book, where all the code used in *Evolution* 2014 is printed. The book includes additional sections featuring insightful commentaries by renowned critics like John Cayley, Maria Engberg, and Jesper Olsson. Some of the ontological questions that arise out of evolutionary digital poetry are acknowledged by these critics. Cayley notes that the work is "an extension of his [Heldén's] field of poetic life, his articulated breath, manifest as graphically represented linguistic idealities, fragments from poetic compositions, I assume, that were previously composed by privileged human processes proceeding through the mind and body of Heldén and passing out of him in a practice of writing. . . . I might be concerned, troubled because I am troubled philosophically by the ontology . . . the problematic being. . . of linguistic artifacts that are generated by compositional process such that they may never actually be—or never be able to be . . . read by any human having the mind and body to read them." (Appendix 2: "Breath," n.p.). He questions the ontological dilemma of the art betraying the mind and body of the artist; generating itself incessantly, uncontained in its creative framework, disembodied in its creative muse and undeciphered by the consciousness. The disembodied nature of technical cognition and the sense of excess, created by the cognitive assemblage; uncontained and unimagined by human minds and bodies are called into question here and it gestures towards the generation and creation of art and cultural artifacts independent of human influence and imagination.

Jesper Olsson, in "Appendix 4: We Have to Trust the Machine," discusses the self generating code as "an attempt to align the subject with the world, to negotiate the differences and similarities between ourselves and the objects with which we co-exist." This negotiating symbiosis is between human and machine that culminates in the merging of artificial and biological consciousness. The hybrid consciousness is an evolving entity that displays high linguistic competence but discursive competence at a nascent level. The algorithmic cognition appears to be chance operated that circumvent the lyrical fetters in order to interrogate the linguistic volatility in the poetic values of referentiality and expressiveness; of intentionality and productiveness. Not dissimilar to aleatory works, this digital generative work of art presupposes the renunciation of authorial control over the creative process and foregrounds the creation as an entity that demands aesthetic valuation and promises liberation from abstractions, meanings and associations. The work is also marked by an excess of linguistics output that exceeds human capacities and proves that even the most vaulted preserve of human consciousness, sensitivity, and creativity is not necessarily exempt from collaboration and competition with a non-conscious machine. Unfortunately, this evolutionary prospect of cognitive excess acts as a counter force to imagination and creative thinking and permeates the sacrosanct dominion of human beings as rational thinkers and creative artists. We are now on the verge of technological developments that promote our computational symbionts to full partnership in our literary endeavours. *Evolution* showcases the potency of literature when conceived as a cognitive assemblage, wherein cognition is shared between human and technical entities. Information, interpretations, and meanings flow in a multidirectional manner within the assemblage, moving from humans to machines and vice versa.

Conclusion

Humans living in societies with deep technological infrastructures are already enmeshed in cognitive assemblages shaped and interpenetrated by technical cognition, including language-learning systems. Cognitive assemblages

have substantially narrowed down the linguistic and creative disparity between humans and their digital interlocutors. In the posthuman world, human intelligence and machine cognition are two sides of the same coin resulting in a symbiotic cognition that supersedes human cognition and imagination; unrestricted by human capacities and unfettered by cultural and social norms. This symbiosis not only reshapes creative expression but also redefines the potential for collaboration across species and systems, where human, non-human digital agents operate together as nodes in a broader cognitive ecosystem. Within such assemblages, the notion of individuality gives way to relational networks that coalesce human, digital, and ecological intelligence.

Nevertheless, the intricate interplay of human-technical systems, prevalent in the infrastructure of advanced societies, leads us to perceive humans more modestly as just one category of cognizers among various others. Our planetary ecology comprises a co-constitution involving humans, nonhumans, and technical devices, highlighting our responsibility to safeguard and maintain the cognitive abilities exhibited by all biological life forms. Simultaneously, we must also demonstrate reverence for the material forces that give rise to these cognitive capabilities and for the continuity of our existence, it is imperative to ensure the preservation and wellbeing of the environment upon which all cognition fundamentally relies on.As Heldén and Jonson's work illustrates, our narratives, technologies, and environments are no longer separate entities; they are co-creative forces that shape our cognitive experiences and expand the scope of what it means to think, create, and communicate.

Works Cited

Abrams, Loney. QA: Trevor Paglen on how machine-made images are asserting power over society and changing art history. (Interview with Trevor Paglen). Artspace. 2017. https://www.artspace.com/magazine/interviews_features/qa/qa-trevor-paglen-on-how-machine-made-images-are-asserting-power-over-society-54992

Braidotti, Rosi. *The Posthuman*. Cambridge, UK: Polity Press. 2013.

Cayley, John. Appendix 2: "Breath" *Evolution*. Stockholm: OEI editör. 2014.

Clark, A., & Chalmers, D. "The Extended Mind". *Analysis*, 58(1), 1998, 7-19.

Gallagher, S. *Enactivist Interventions: Rethinking the Mind*. Oxford University Press. 2017.

Hayles, Katherine. "Literary Texts as Cognitive Assemblages: The Case of Electronic Literature", *electronicbookreview.com*, 2018. https://doi.org/10.7273/8p9a-7854.

---, "Human and Machine Cultures of Reading: A Cognitive-Assemblage Approach", PMLA 133/5, 2018. pp. 1225–1242.

---, *Unthought: The Power of the Cognitive Nonconscious*. Chicago: University of Chicago Press. 2017.

---, "Cognitive Assemblages: Technical Agency and Human Interactions." *Critical Inquiry*, 43(1), 32-55. 2016. doi: 10.1086/688293

Heldén, Johannes and Håkan Jonson. *Evolution*. Stockholm: OEI editör. 2014. http://www.textevolution.net/

---, "The Algorithm," *Evolution.* Stockholm: OEI editör. 2014.

Ingvarsson, Jonas. Appendix 5:"The Within of Things," *Evolution*. Stockholm: OEI editör. 2014.

Olsson, Jesper. Appendix 4:"We Have to Trust the Machine", *Evolution*. Stockholm: OEI editör. 2014.

Ryan, M.-L. *Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*. Johns Hopkins University Press.2015.