Natural memory and artificial memory

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Abstract. In the anthropological and social transformation in which we are immersed, human beings now embody both natural memory and the so-called artificial memory, produced through neural networks, predictive systems, and algorithmic self-learning in artificial intelligence. It is necessary to understand how such coexistence—while offering advantages and usefulness, yet inevitably also causing harm and loss—can become collaborative, fostering both thought and action. This proposal, developed in a transdisciplinary and critical perspective, argues for keeping at the center the capacity of natural/human memory, of which artificial memory is ultimately a product. By delineating the differences emerging between the two forms of memory, reflections will be advanced concerning the effects of artificial memory on the human inner world, highly vulnerable, on its cognitive and emotional mechanisms, increasingly eroded by the technocratic system to which, beyond the management of knowledge and power, the externalization of memory is now also being delegated.

Keywords: Natural memory; Artificial memory; Opportunities; Risks; Cognitive impairment.

Riassunto. *Memoria naturale e memoria ufficiale*. Nella trasformazione antropologica e sociale in cui siamo immersi, nell'umano convivono ormai la memoria naturale e la memoria cosiddetta artificiale, prodotta mediante le reti neurali, i sistemi predittivi e di autoapprendimento degli algoritmi dell'intelligenza artificiale. Si rende necessario comprendere come tale coesistenza, che presenta vantaggi e utilità, ma inevitabilmente anche danni e perdite, possa essere collaborativa, agevolando il pensare e il fare. La presente proposta, in chiave transdisciplinare e critica, è di mantenere centrale la capacità della memoria naturale/umana, di cui quella artificiale è il prodotto. Enucleando le differenze che emergono tra le due memorie, si avanzeranno riflessioni riguardo agli effetti della memoria artificiale sul mondo interiore dell'umano, molto vulnerabile, sui suoi meccanismi cognitivi ed emotivi, sempre più erosi dal sistema tecnocratico a cui, oltre alla gestione del sapere e del potere, viene attualmente delegata anche l'esternalizzazione della memoria.

Parole chiave: Memoria naturale; Memoria artificiale; Opportunità; Rischi; Riduzione cognitiva.

1. Introduction

Working memory, short-term and long-term memory, episodic, semantic, yet the list of possible definitions could continue, given the extensive relevance of this field of knowledge which, long investigated by philosophy, has in recent decades gained increasing attention in psychology, neuroscience, and, more recently, in the interdisciplinary area of *memory studies*[1]. Memory is also one of the hinges of the digital world.

It is from the latter that the present work starts, in order to explore, with a future-oriented perspective, whether artificial intelligence (hereafter AI) systems—with their constant and silent interference in every domain of daily life, may serve as an expansion and a genuine support to natural memory, and in which ways, or whether, instead, they may lead to a reduction and decline in human cognitive and emotional faculties[2].

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[1] For references on the evolution of Memory Studies, see online G. Bartolini (2024), *Ricordare e capire il… passato. Il valore della letteratura per i Memory Studies*: https://rosa.uniroma1.it/rosa03/status_quaestionis/article/download/18765/17751/40042.

[2] The issue is part of the "Great Debate" around the numerous researches concerning AI, dating back to the last century, among which it aroused a lot of interest the book by J.R. Searle (1984), *Menti, cervelli e programmi. Un dibattito sull'intelligenza artificiale*, edited by Tonfoni. Milan: Clup-Clued.

To this purpose, a report is cited: with regard to generative AI, in Italy, according to data provided by Vincenzo Cosenza, the well-known ChatGPT, developed by OpenAI and launched in 2022, grew from 2.4 million monthly users in 2024 to 8.8 million in 2025, whereas in 2023 it was still below one million[3]. The use of AI spans different generations. Individuals born in the previous century who now interact with ChatGPT draw upon a consolidated memory, derived from pre-existing knowledge acquired predominantly through analogic and tangible means. The broader this reservoir of knowledge, the greater the ability to recognize the reliability of the model's responses to specific queries, and, most importantly, to verify whether the output is truthful, just as Mnemosyne inspired humans in their pursuit of truth itself. In the intergenerational passage, it is crucial to preserve such faculties of discernment, so as to enable a conscious and balanced use of technological "assistants" and safeguard memory (Carr, 2020).

In this contribution, adopting a critical perspective, we shall engage with ongoing debates concerning AI, particularly focusing on the theme of memory, within a theoretical framework drawing upon philosophy, psychology, and the social sciences. Special attention will be devoted to the powerful technological transformation currently underway, which entails a form of disengagement by *Sapiens* from the active memorization of content, in favor of the immediate retrieval of information and knowledge through external, network-connected devices, capable of returning infinite data stored and processed by algorithms on a statistical basis (Cristianini, 2023). The aim is to argue that natural memory—although influenced by spatiotemporal contexts and heterogeneous factors, and therefore not "purely natural"[4] and inherently imperfect—cannot be neglected, let alone replaced, by artificial memory, now widely disseminated and integrated, for multiple reasons that will be discussed below. Before proceeding, it is necessary to specify how the two forms of memory are to be considered in the present discussion. According to Treccani (online, entry Memoria), memory is:

> (…) la capacità di ritenere traccia di informazioni relative a eventi, immagini, sensazioni, idee, ecc. di cui si sia avuto esperienza e di rievocarle quando lo stimolo originario sia cessato riconoscendole come stati di coscienza trascorsi, sia i contenuti stessi dell'esperienza in quanto sono rievocati, sia l'insieme dei meccanismi psicologici e neurofisiologici che permettono di registrare e successivamente di richiamare informazioni[5].

Artificial memory, on the other hand, is here understood broadly as the set of external systems "delegated" to computers and the Internet: digital devices, cloud services, agents, assistants, and AI applications that, through architectures inspired, at least metaphorically, by neural functioning and based on algorithms, encode, store, retrieve, and return information and semantic content (Hoskins, 2011). While such delegation enables rapid access and ready retrieval of information, it simultaneously reduces the exercise of natural memory, with potentially negative consequences for mechanisms of learning, memorization, and critical thinking, extending even to cognitive decline (Bloudoff, 2013; Ali *et al.*, 2024), as will be discussed later.

It should be stressed that this proposal does not aim to construct a dichotomous or competitive opposition between the two forms of memory, but rather to reaffirm the centrality of natural memory—i.e. of the human being (Bertolaso, Marcos 2023), which, by maintaining its functional autonomy, can benefit from cooperation and integration with artificial memory (Ienca, 2019). This is

[3] See L. Tremolada, *Ogni mese 8,8 milioni di italiani usano ChatGpt. L'app è usata dal 37% degli studenti*, in «Il Sole 24 Ore», July 2, 2025, available online: www.infodata.ilsole24ore.com/2025/07/02/ogni-mese-88-milioni-di-italiani-usano-chatgpt-lapp-e-usata-dal-37-degli-studenti.

[4] An extensive examination of natural memory and artificial memory is dedicated by T. Maldonado (2006), *Memoria e Conoscenza.* Milan: Feltrinelli, p. 86 sgg.

[5] (…) the capacity to retain traces of information relating to events, images, sensations, ideas, etc., experienced, and to recall them once the original stimulus has ceased, recognizing them as past states of consciousness; it refers both to the very contents of experience insofar as they are recalled, and to the ensemble of psychological and neurophysiological mechanisms that allow for the recording and subsequent retrieval of information (*My translation*).

essential in order to remain faithful to an anthropological existence, characterized by both strengths and vulnerabilities, shaped by the relationships of a humanity that has advanced across millennia, yet still has much to explore—both cognitively and civically. Indeed, the ensemble of rational, emotional (Arsena, 2024), and affective components guides life trajectories and choices, grounded in bodily and tangible proximities, coincidences, contingencies, spirituality, customs, traditions, and conflicts, with collective effects over time. For this reason, human mnemonic activity cannot be reduced merely to rationality and calculation, as in computational artificial memory, but constitutes the daily construction of social beings who, in a maieutic sense, extract their existential contents from the traces of the past, which endure and remain open to interpretation[6].

Thus, the parallels between the two forms of memory and their respective developments will make it possible to highlight differences and points of convergence, advantages and risks, with the aim of reaffirming—as already stated—that human activity, despite being inherently prone to inaccuracies and errors, bears the responsibility of maintaining control over mnemonic processes. After all, artificial memory exists only because it is produced and sustained by humans who, with the rapid advancement of technology, are now contemplating the surpassing of their own intelligence through the autonomous agency of AI[7]. Such a scenario presents numerous challenges and issues, not only epistemological, but also ethical, social, and political, pertaining to responsibility, transparency, fairness, and the protection of privacy.

The following sections will outline the main transformations that memory is undergoing due to the pervasiveness of AI and the associated risks, supported by some empirical studies on the potential for cognitive reduction.

2. Transformations of Memory

Memory originates from the Indo-European root "men", with the meaning of "that which persists", which is found both in the noun μνημοσύνη (*mnēmosýnē*), from which derives the name of the Greek deity Mnemosyne, daughter of Uranus and Gaia and mother of the nine goddesses (Muses) of the arts and sciences, and in the verb μιμνήσκω (*mimnēscō*), "I remember" (Treccani online, entries Mnemosine, mnemonico). This etymology leads us, on the semantic plane, toward the preservation and transmission of knowledge acquired over time and arising from cognitive and emotional faculties. In ancient Greece, the aedi recited the great epic poems through mnemonic techniques, an art that developed and found its most extensive application until the invention of writing and beyond[8]. One may think, for example, of orations or theatrical forms that grounded their memory on its use. Writing, however, immediately aroused concerns, positioning itself alongside orality. Plato, for instance, following the Socratic line, referred to writing as τέχνη (*téchnē*), capable of transmitting data and information mechanically, without necessarily committing them to memory beforehand but with the possibility of reading them. In the Phaedrus (2018, 275c), he raised the issue of how to render knowledge truly available to all and not let it fall into oblivion. Probably, if Plato lived today, he might revisit and overturn the myth, since writing, understood as the outcome of thought, reflection, critical judgment, and the gathering of ideas, is one of the means to keep natural memory alive and active. Moreover, the best way to truly keep it alive is to do so manually, as it stimulates the brain as a creative act. This also demonstrates that innovation can bring benefits, though recognized and accepted over time, after the pioneering phase.

[6] See P. Jedlowski (2002), *Memoria, esperienza e modernità. Memorie e società nel 20. secolo*, Milan: FrancoAngeli, p. 62.

[7] N. Cristianini (2025) dedicates a wide-ranging discussion to the theme of AI as a challenge to human intelligence and its overcoming in *Sovrumano*: *oltre i limiti della nostra intelligenza*, Bologna: Il Mulino.

[8] See "a classic" of memory, F. A. Yates, *L'arte della memoria*, Turin: Einaudi, 1987. The first part of which is dedicated to mnemotechnics.

Natural memory sustains the arduous task of living, anchoring us to certainties derived from experience and creating a connection between past actions and those yet to come, both individually and socially. In particular, it offers the faculty to choose between what one wishes to remember and what one wishes to forget; it represents the *continuum* of our existence[9]. It moves like magma within the body, constructing and reconstructing itself, thanks to the contribution of elements shared by the community. Even autobiographical memories are not entirely autonomous but can be influenced by those of others (Maldonado, p. 30). Its traces return, make themselves felt, and can become burdensome, to the point of seeking oblivion to be relieved of the weight. Yet they may instead provide consolation in a glorious past, in a lived experience that penetrates the skin and reaches the viscera. Memory is the transit of happy, dramatic, and tragic events, in a whirlwind of recall and removal; it is a reference point in a system where one can recognize oneself in the other, with whom one establishes a connection and enters into relation[10].

Siegel argues that: «La memoria non è solo ciò che possiamo ricordare del passato; (…) secondo una definizione più ampia è l'insieme dei processi con cui gli eventi del passato influenzano le risposte future»[11]. He also states that the brain is composed of neural networks that allow processes of information encoding, thereby fostering learning. Experience influences the structure of the brain and its impact on interactions with the world and on the development of the relational mind, which carries out mnemonic activity. Our brain is in continuous development; thus, we learn and remember throughout our lives. The process of remembering is not automatic but follows a series of variables that allow the reactivation of a visual and cognitive circuit. The brain, in fact, is not endowed with a storage depot but depends on the activation of the neural network and through associations with various levels of experience: semantic (references to art), autobiographical (our positioning of ourselves at that moment), somatic (bodily sensations), perceptual (noises, particular smells), emotional (moods), and behavioral (performance of actions). Memory, therefore, is not static but is a set of active and dynamic processes that change during growth and in the mature phase of life, re-categorizing lived experiences, which implies continuous revision according to new perspectives influenced by environmental stimuli. This activity transforms memory, its consolidation, as well as its elimination[12]. The representation of objects in time and space allows the elaboration and management of information, the development of skills enabling interaction with the environment, and the capacity for problem solving.

A prominent role is also played by material culture, not materialistic culture, which proves to be a mediator of memory, as well as an activator of emotions connected to the past. Objects themselves, in fact, are a physical presence in human experience, with highly relevant implications in the cognitive, psychic, and emotional configuration of individuals and communities. They have been studied mainly, from psychoanalytic or deconstructionist perspectives, as emblems of the ineffability of trauma or as symptoms of contradictions disseminated by progress. They have transitive functions, as "nodes" and junctions, cardinal points where part of lived experience converges, and upon which the present grafts itself through forms of narration, reflection, and lyrical evocation. They are connected to memory and trauma, with reference to forms of negotiation of the meaning of history and of intercultural and intergenerational confrontation. Material objects engage with forms of elaboration and removal of individual or collective traumatic experiences. The banal objects of daily life, the so-called "things", in processes of elaboration of violence and pain, can be transformed into

[9] See the article available online: www.accademianazionalevirgiliana.org/ANV23/images/Mariangela/Multimedia/COVID19/Copia_di_Archivio_e_memoria.pdf.

[10] See M. Ferraris (2025), *La pelle. Che cosa significa pensare nell'epoca dell'intelligenza artificiale*, Bologna: Il Mulino.

[11] D. J. Siegel (2021), *La mente relazionale. Neurobiologia dell'esperienza interpersonale*, Milan, p. 153: Memory is not only what we can recall of the past; (…) according to a broader definition it is the set of processes by which past events influence future responses (*My translation*).

[12] Ibid., pp. 153-214.

therapeutic or harmful texts, at times linked to elaboration, at other times to the removal of what was suffered or perpetrated[13].

Now, in the overwhelming transformative impact in which the human–machine relationship is increasingly growing and hybrid, the role of natural memory, understood as a set of biological, experiential, and emotional factors, may represent the connecting path, a true junction between what is not mediated by a screen, a chip, or similar prosthetic objects, and what, instead, is constantly artificialized. This transformation from natural memory to artificial memory, made by and of algorithms rather than of thoughts and ideas, arouses fears and concerns, which are justified whenever human memory is not strengthened. After all, the human being needs to anchor themselves to solid memorial bases in order to move upon them, understanding which to erase because they are dysfunctional or disturbing, and at the same time has the duty, as a witness of the age in which they live, to improve the world they inherited and will leave to posterity. This is a civic and social commitment that no artificial automaton will ever be able to fulfill, since it is incorporeal, devoid of temporal, spatial, and sentimental ties with the before, during, and after[14].

Specifically, social platforms exhume memories and enter into the narration of our essences through the power of emotions, sometimes manipulating them (Oliverio Ferraris, 2024).

Boccia Artieri argues that:

> Se affidi il compito al tuo telefono e alle piattaforme devi tenere conto del fatto che non solo archiviano, ma selezionano e ripropongono**.** Delegando, accetti che decidano cosa riportare in primo piano e cosa lasciare sullo sfondo. C'è una curatela algoritmica della memoria: diventa un'attività orientata a generare emozione, non una selezione consapevole. Ed è parziale: non è quello che vuoi ricordare, ma quello che emotivamente vuole essere raccontato nel presente, la stessa logica delle Storie, che durano solo 24 ore[15].

And he continues: «L'AI più che ripescare, genera: prende frammenti estraibili, li remixa, li ripropone quando e come decide lui/lei, anche in maniera brutale. Quello che viene fuori, magari con una musica di sottofondo per evocare ricordi, non è veramente tuo. Ancora una volta è emotivo, e privo di profondità»[16].

Artificial machines have every interest in not offending our sensibilities, because by triggering positive emotions, people linger and interact more (Tyng *et al.*, 2017; Zhu *et al.*, 2022). This constant and pervasive mechanism fosters the profits of AI producers and managers, whose priority is certainly not the diffusion of happiness for all. ChatGPT & Co. erase memory and can create false recollections. Generative AI, in fact, must always be explained everything from the beginning, as if it had to convince us each time of being the best possible interlocutor. In doing this, it learns from our data[17].

Quattrociocchi warns that:

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[13] On this part dedicated to objects related to memory, see M. Giancotti, L. Marfè, P.Violi (2023), *La memoria degli oggetti*, Milan-Udine: Mimesis.

[14] On the corporeity and incorporeity of intelligence, see M. Ferraris at the following online article: www.pressreader.com/italy/corriere-della-sera/20240801/282527253704307?srsltid=AfmBOopZ8Td-RM84f_4LEs0Y9-Zgqc3I-KE9_pUPNxpBJsYwTcp8zkFy.

[15] The interviews with G. Boccia Artieri, Full Professor of Communication Sciences at University of Urbino e with W. Quattrociocchi, Full Professor of Data Science at Sapienza are in M. Pennisi, *Cosa sta facendo (e cosa farà) l'AI ai nostri ricordi? «La memoria diventa un prodotto»*, in «Il Corriere della Sera», 26.07.2025, avalaible online: /www.corriere.it/sette/25_luglio_26/memoria-prodotto-social-ai-9e574bba-e6b8-4b57-a8c4-06c881080xlk.shtml. If you entrust the task to your phone and platforms, you must take into account the fact that they not only archive but also select and re-propose. By delegating, you accept that they decide what to bring to the foreground and what to leave in the background. There is an algorithmic curatorship of memory: it becomes an activity oriented toward generating emotion, not a conscious selection. And it is partial: it is not what you want to remember, but what emotionally wants to be narrated in the present, the same logic of Stories, which last only 24 hours (*My translation*).

[16] Ibid.: AI, more than retrieving, generates: it takes extractable fragments, remixes them, reproposes them when and how it decides, even brutally. What emerges, perhaps with background music to evoke memories, is not truly yours. Once again, it is emotional, and devoid of depth (*My translation*).

[17] Ibid.

> Il contesto è un elemento fondativo nell'interazione che hai con la macchina in una determinata finestra temporale. Ma questa interazione evapora: non rimane traccia. Puoi usare dei prompt per cercare di farle ricordare, ma il modo in cui viviamo questa interazione racconta più della nostra mancata comprensione dello strumento che della sua reale capacità. Se cerco di instaurare un rapporto duraturo con un LLM, emerge subito un vuoto emotivo: è evidente il bisogno, umano, che sta dietro quel tentativo[18].

And he continues: «Oggi il limite è architetturale, ma sarà superato: basterà aumentare la quantità di contesto memorizzabile e creare un'infrastruttura condivisa tra tutte le sessioni. È solo questione di tempo»[19].

At present, in fact, ChatGPT is characterized by "systemic amnesia", since it does not retain the lists of interactions, although users expect it to remember[20], but this function may soon be enhanced.

Now, human beings have always sought to leave signs and traces of their existence and activity in the space and time in which they lived, to establish and maintain—or adapt and change—the value system of society. Even before true writing with the invention of alphabets and later Gutenberg's press, humans have always literally imprinted their marks of passage in places, for example, with cave pictograms, in order to transfer to future generations reference points from which to resume the journey of knowledge and its expansion. They have always sought means and tools to support their memory and recollections, at first for survival—in the case of a path to avoid due to the presence of beasts or enemies, with a purpose of human solidarity—or, conversely, to wage war with misleading and provocative signs. Subsequently, the progress of civilization exponentially increased the domains of knowledge, sectoralizing them, to the point that it would be impossible to collect solely with human minds the entire heritage of mnemonic production that already characterizes the individual alone, not to mention the infinite and diverse memories—by origins, uses, and customs—of communities around the world. Thus, with the advance of technology, humans have always used and equipped themselves with memory supports that allow them to organize and archive their activities, both in private and through the construction of buildings destined for this purpose, such as archives, libraries, land registries, and so on. In the Digital Age, with the overabundance of true and false information chasing each other on social media and platforms, it is no longer easy to clearly distinguish the public content of a piece of news from its private aspect, which becomes memory, especially considering the enormous amount of data on citizens' lives collected both by public authorities and financial actors, ending up in AI cloud storage. Although regulations aim to keep private and public separate, it is increasingly less possible to operate within this rationality, given the continuous transit from the personal to the collective dimension and vice versa[21].

Currently, material supports continue to exist in the form of servers consisting of infinite digital disks placed in special cabinets, such as those in the immense warehouses of major tech corporations in Silicon Valley.

So far, archiving has mainly concerned human production of writings, images, music, photographs—all fully accessible. At present, it concerns the management of the infinite quantity of data made available through the traces left on connections to a so-called intelligent digital device, which profiles and maps the user. Memory is entrusted to the collection of infinite databases, delocalized on external supports, to cloud storage spaces, shared databases, up to the boundless diaries

[18] Ibid.: Context is a foundational element in the interaction you have with the machine in a given time window. But this interaction evaporates: no trace remains. You can use prompts to try to make it remember, but the way in which we live this interaction tells more about our lack of understanding of the tool than about its real capacity. If I try to establish a lasting relationship with an LLM, an emotional void immediately emerges: it is evident, the human need underlying that attempt (*My translation*).

[19] Ibid.: Today the limitation is architectural, but it will be overcome: it will suffice to increase the amount of storable context and create an infrastructure shared among all sessions. It is only a matter of time (*My translation*).

[20] See F. Cerati, *Intelligenza artificiale e memoria. Siamo destinati a soffrire di «amnesia digitale»?*, in «Il Sole 24 Ore», February 11, .2025, avalaible online: www.ilsole24ore.com/art/intelligenza-artificiale-e-memoria-siamo-destinati-soffrire-amnesia-digitale-AG4wHnoC?refresh_ce=1.

[21] See the article available online: https://moked.it/blog/2023/01/05/memoria-degli-archivi-e-archivi-della-memoria.

in social networks, thus delegated (Liberace, 2020). On the other hand, in the constant and continuous growth of immeasurable intellectual productions and the vast contents accumulated over millennia, an external memory may be a way to preserve them from the wear of time and an aid in their placement and retrieval. All this must be done with full respect for an ethics on which the human being must work in order to accompany this transition and to minimize the possibility of errors, which will inevitably occur, so as to avoid the alteration of reality and truth. Memory, understood as the heritage of all, and not as the inalienable private property of the individual (Maldonado, p. 33), can contribute to the good functioning of society. Beyond possessing knowledge, it is fundamental to be able to access information.

The frequent use of AI by users allows managers to enhance algorithms day by day, whose operating formulas are known to insiders. This makes AI sophisticated, with a language and an ability of interaction capable of increasing its own memory with statistically plausible responses. However, artificial agents themselves can communicate with each other, drawing on data from which they can also learn, as well as associate, connect, store, and process, recognizing patterns, models, and paths (Liberace, 2020). At this point, problems could arise in verifying the veracity of what is stored by the machine, which is still the result of probabilistic extrapolation, albeit with the language of very high-level statistics.

In short, in the digital field, everything is transforming very rapidly: the methods acquired in the analogic world, with their value system, can represent our compass to guide us toward the new, which is already particularly impactful and laden with uncertainty concerning our lived experiences, our cognitive, cultural, and social processes. Artificial memory, being incorporeal, is able to emulate mnemonic capacities, but it has no recollections tied to sensitivity, sacredness, or feelings. Therefore, it has only the value of an archive, ordered and coded according to rules (Liberace, 2020). The risk that humans run in relying on delocalized memory is the impoverishment and restriction of their own capacities and abilities. The world, in fact, is flooded with information and infinite data, which form the basis of memorization, but in overabundance alter concentration and attention, as will be better seen in the following paragraph.

3. Risks to Natural Memory

Within the epistemic scope of epochal technological change, beyond its potential benefits—such as, for instance, in the clinical field for the prevention, diagnosis, and treatment of mental illnesses[22]—the focus here is instead directed toward its critical aspects, with particular reference to the possible reduction of cognitive function and of the modalities of knowledge transmission due to constant connection to the Internet and AI systems. Indeed, the concern that artificial memory might "weaken" natural memory is supported by various empirical studies: among others, Sparrow *et al.* (2011) demonstrated that individuals, by easily retrieving information and knowledge online, are subject to the so-called *Google effect* (Gong, Yang, 2024), namely the tendency not to memorize autonomously and to recall less. This phenomenon is part of the broader framework of *cognitive offloading* (Risko, Gilbert, 2016; Peng, Yeh, 2025), that is, the cognitive "discharge" resulting from the use of technological tools to process a task, particularly when trust in such tools has been established.

This probable reduction has also been the focus of a recent study conducted at the MIT Media Lab in Boston. In the research led by Nataliya Kosmyna *et al.* (2025), three groups of participants, drawn from a sample of 54 volunteers, were compared in the elaboration of three short texts on predefined topics. The first group ("Brain-only") could write solely on the basis of their own mental resources, without Internet access. The second group had access to the Google search engine. The third group, instead, used ChatGPT. The participants' brains were analyzed during the experiment through

[22] In reference to the opportunities offered by neurotechnological innovations, which raise fundamental legal, ethical, and social issues in interfering with another person's neural activity, thereby requiring new rights to protect both privacy and moral integrity, see A. Lavazza, V. A. Sironi (2022), *Neuroetica. Interpretare e orientare la rivoluzione delle neuroscienze*, Rome: Carocci, pp. 217-226.

electrodes connected to an electroencephalogram: in the very same writing task, the three groups exhibited markedly different levels of brain activation. Compared to the baseline level of the group writing without digital assistance, the group using the search engine registered a cerebral connectivity 34–48% lower; the ChatGPT group showed a cerebral connectivity 55% lower. Thus, the more extensive the external support, the more reduced brain activity appeared to be, particularly for the ChatGPT group, whose performance was poorer than that of their counterparts at every level: neural, linguistic, and scoring.

The "Brain-only" group showed activation of brain areas associated with creativity and self-monitoring. These functions are essential for generating, planning, and revising content. Those who used Google activated primarily the occipital and visual cortex, the regions responsible for assimilating information via sight from the screen and then collecting it. Finally, those who used ChatGPT mainly activated areas linked to almost automatic functions within an external framework.

Therefore, this experiment demonstrated that relying entirely on AI generates alignment of thought and repetition of messages. Furthermore, in 83% of cases, those who had composed their texts with ChatGPT subsequently struggled to cite phrases from their own writings just a few minutes after submission. Their attention had been focused exclusively on passively reproducing externally generated information, without perceiving it as their own content. By contrast, nearly all of those who had written independently were able to cite sentences from their texts almost verbatim, showing much greater attention to the content and meaning of their work (and not merely to its form). In this latter case, participants remembered more compared to those who had relied on AI. Thus, under the experimental conditions applied, memory consolidation—understood as the ensemble of neurobiological mechanisms enabling the transfer of information from short-term memory to more stable long-term memory, was negatively affected by AI.

Now, without demonizing it, AI with its external memories, conceived as a support for human activity[23], may represent a benefit for humanity as a whole, though inevitably with risks, since it is a machine to be steered. This, however, will only hold true once it becomes available to all, given that social and political inequalities will intensify between those who can access and competently use it, and those who will be excluded for lack of economic and cultural resources.

Returning to natural memory, it is an organism, or rather, as Eco (2014) put it, «a muscle like those of the legs: if you do not exercise it, it withers, and you become (from a mental point of view) differently abled»[24]. Thus, exercising and consolidating it means, above all from an ethical standpoint, not allowing oneself to be excessively absorbed by the distracting present, and ultimately avoiding the risk of "forgetfulness", as highlighted by the aforementioned studies. The danger posed by seeking knowledge from artificial systems while evading effort and reflection, and by entrusting ideas, thoughts, and inventions that feed the infinite databases through interaction with external mnemonic tools, must not be underestimated but prevented (Stiegler, 2023). Training logic and reason, which are the handmaids of memory, means resisting the simplification of the technological *hic et nunc*, and instead equipping oneself with the tools needed to face the complexity of life. Consequently, systematically removing the exercise of memory through the facilitation of artificial devices inevitably entails relinquishing something of our life and our brain[25].

In many contexts, it is argued that the use of AI will liberate us from repetitive tasks, leaving room for creativity. However, it is well known that natural talent, if not trained through commitment, practice, concentration, and dedication, withers. This is particularly true for development during the age of learning and schooling, when it is crucial to exercise the use of internal memory in order to strengthen it, render it flexible, and enable it to accommodate new elements that enhance it.

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[23] Expression used by A. Fabris (2025), who has dealt a lot with ethical issues related to AI in his writings. See, in particular, *La filosofia nell'epoca dell'intelligenza artificiale*, Rome: Carocci, pp. 13, 146.

[24] Umberto Eco, *Caro nipote, studia a memoria*, in «L'Espresso», January 1, 2014, available online: https://lespresso.it/c/idee/2014/1/3/umberto-eco-caro-nipote-studia-a-memoria/18021.

[25] See the article available online: www.agendadigitale.eu/cultura-digitale/tecnologia-contro-complessita-ecco-il-prezzo-che-il-cervello-paga-alla-semplificazione.

4. Conclusions

Memory has been extensively explored by the classics of thought, including Plato, Aristotle, and St. Augustine, as closely connected to the temporal dimension of the past or to introspection, imprinted in the "soul that learns". From their theories emerged inquiries exclusively tied to the human essence, made of intellect and interiority. Progress is leading us toward an externalization of our memory, which only time will determine whether it will truly benefit the human condition, which continues to need to remain connected with its inner sphere.

Considering that natural memory includes the comprehension and interpretation of what happens, it cannot be duplicated, perhaps only distantly simulated; it still deserves to be explored as a portion of the brain—the most mysterious organ of life, which needs to be nourished both materially and spiritually; as it is embodied in a body that learns throughout life, it has a thread that sustains it and keeps it within the weaving. The body is mutable, absorbs from environmental conditions, knows, experiences, memorizes, and, on the basis of these aspects, decides what meaning to give to its existence in respect of itself and of those around it.

At this point, it is necessary to understand in what ways to delegate the actions concerning learning, knowledge, skills, and identity in order to preserve our intelligence, on which memory is based. Having artificial memories, which will develop increasingly, has the advantage of freeing space and time in ours, which could be a way to devote oneself to seeking a different meaning in life. Using artificial memories means ethically and politically reshaping procedures, protocols, and rules in human cooperation, but without undermining what makes humanity such, namely its distinguishing itself in the uniqueness of preserving an anthropological memory. Therefore, it is necessary to combine natural memory and artificial memory, to find forms of coexistence, complementarity, and cohabitation, in order to construct the epistemic scope of change and guide the new course. Memory, in its aspects of recalling social relations, can be an antidote against the repetition of forms of violence and against the re-proposal of atrocities. The antibodies exist: we humans and our capacities to learn, invent, and know not in a procedural and standardized way, but intelligently. For this reason, it may be useful to communicate judiciously with the artificial connectionist world[26], granting it the right space, not dominance, in order to grasp its opportunities, when these will be available to all.

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[26] See M. Pasquinelli (2025), *Nell'occhio dell'algoritmo. Storia e critica dell'intelligenza artificiale.* Rome: Carocci, pp. 177-196.

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