

Imitation, language and the formation and expansion of thought

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*“It is not the consciousness of men that determines their consciousness; but their social existence [their extensions]
that determines their consciousness.”*

Marx

“the order and connection of ideas; is the same as the order and connection of things.”

Spinoza

“the object is not only structure but also regime.”

Simondon

“matter reveals to us our own strengths, suggesting a system for categorising – bounding our energies”

Bachelard

“There is only information, when what emits signals, and what receives them, form a system.”

Simondon

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List of abbreviations

CLT: Cognitive Load Theory

AI: Artificial Intelligence

LLM: Large Language Models

WM: Working Memory

Foreword

My thesis's genesis and preliminary framework were based on exploring the concept of extended cognition. Initially, I planned to examine the role of artificial intelligence and other technological innovations as augmentations of our cognitive capabilities. Hence, my focus was supposed to be how modern technological innovations redefine our cognitive landscapes. This initial inquiry arose from practical considerations in educational psychology.

However, my research journey underwent a significant change. It evolved into a critical examination of ("extended") cognition. This transition signaled a departure from an uncritical endorsement of extended cognition towards a more refined and integrated understanding, framing cognition as an embodied, contextual, and situated activity. Therefore, I removed almost all references from the concept of extended cognition from this discourse. I realized that engaging with this concept would only distract from the core focus of my inquiry. Additionally, others have already thoroughly demonstrated the fragility of the extended mind thesis. As a result, my task took on a new direction: evaluating the possibility of the evolution of cognition and how that might take form.

My thesis now endeavors to analyze the evolving nature of cognition in relation to technological artifacts. In the current environment, students rely more on spellcheckers, artificial intelligence, and large language models as educational aids. While there are debates on the merits of these developments, I aim to provide a nuanced perspective that demonstrates that technological dependency is not always something to be feared and that its dependency might invoke new cognitive capabilities.

This shift from emphasizing extended cognition to adopting a critical and integrative approach marks the beginning of a more comprehensive philosophical exploration. This shift necessitated a re-evaluation of the foundational question: *What constitutes learning?* What is the essence of thinking or cognition? What do we gain from our cognitive extensions, and is it appropriate to speak of extensions? Should we think about the expansion of cognition?

Moreover, it became a thesis about becoming – a thesis on ontology, which was not what I expected when I delivered my proposal.

However, writing about the formation and evolution of our consciousness is a project that is doomed to fail, for many far better equipped have ventured into this area, and we still do not have a grasp on it. However, I could not find something more interesting and motivating to write about for my final paper. As such, the topic has provided me with much difficulty and, simultaneously, a lot of freedom.

The intellectual framework of this thesis is primarily indebted to the ideas of Gilles Deleuze and Guattari, C. Jung, Gilbert Simondon, Gaston Bachelard, Jacques Derrida, Maurice Merleau-Ponty, Lev Vygotsky, G.W.F. Hegel, Heidegger, and Kant. Their insights have significantly influenced my argumentation and writing style, incorporating diverse philosophical thought encompassing phenomenology, constructivism, and dialectical thinking. Although not all of them are cited in the current work, they have influenced my process. As an educational psychology student, I have also incorporated insights from psychologists who have written about the interaction between instruments and the formation of thought. In my psychology graduate thesis, I previously wrote about the interaction and comparison between writing on a keyboard and handwriting. As such, this philosophy thesis serves as a continuation of that product.

I am grateful to Floris van der Berg and Hub Zwart for their guidance and insight. Their support has been crucial in navigating the complex terrain of this research. I am also grateful to my partner, Allanyx, whose support has been invaluable to this work. Lastly, I also thank my friends, especially Vijay and Pawel, for listening to me talk about this and other topics at length.

I found the topic so intriguing that I will immediately start working (after this) on this topic or the extension of this topic for my master's thesis. This highly incomplete thesis is a start for further inquiry. Here, I have not done a particularly good job articulating what I intended to do. However, I do believe that I have said something useful in some sections. I have also rushed the writing in some places. However, hopefully, a gist or a sentiment of the project is

communicated to the reader. If I want to achieve something with this disorganized piece of writing, it is that trusting in technology (that lowers resources for the performing of repetitive tasks) might facilitate the emergence of a way of thinking-with similar in value to language or better. In any case, I do not think that spot is reserved exclusively for language.

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Abstract

Imitation, language and the formation of thought

This thesis investigates the interplay between technology, cognition, and the genesis of thought. It begins with an Aristotelian view of imitation as a fundamental cognitive process that is essential for learning and extending cognition through representation. Here, technology is interpreted as a form of representation, with language as the primary instrument shaping cognition. Through adopting Vygotsky's concept of the transition from external speech to *inner speech*, this framework is extended to all forms of technology, thereby broadening the potential for cognitive internalization. This is emphasized by incorporating Bachelard's assertion that cognition is shaped by external materials or instruments. By aligning with Derrida, the thesis then, examines how these cognitive spaces *undergo erasure*, becoming the apparent origins of their material antecedents. Though these spaces are perceived as the origins of thought, they are preceded by their material counterparts and become fundamental principles guiding cognition and perception. By proposing Simondon's concept of a *technical mentality*, cognition and our instruments can be perceived as inherently incomplete. This technical mentality, rooted in imitation, enables the perception that all technology holds the potential to form cognitive spaces that supplement cognition. In sum, the thesis asserts that all technology inherently possesses the potential to form cognitive spaces that enhance cognition.

Keywords: Cognition, Technology, Instruments, Spaces, Internalisation, Externalization

Terms

Artefact/instrument: Tools or artefacts created by humans that aid in cognitive processes, such as language, spellcheckers, and isometric grids. However, what an instrument is also part of the question we are looking into.

Being: An entity that exists in a state of becoming, characterized by its openness and capacity to integrate external influences into its cognitive framework. In the context of this thesis, a being is understood as an entity whose essence and cognitive capabilities are constantly transformed through interactions with technological artefacts and cognitive spaces, embodying the interplay between internal and external processes.

Cognition: The process involving the acquisition, processing, storage, and use of information, encompassing all aspects of perceiving, thinking, understanding, and remembering. In this thesis, cognition is viewed as a contextual and situated activity that is not confined to the internal workings of the mind but extends to include interactions with external technological instruments and environments. This broader conception of cognition acknowledges the integral role of external tools in shaping and enhancing cognitive processes. *Moreover*, cognition itself can be interpreted as a representation in a Kantian manner; it is itself an externalization.

Human: An embodied, contextual, and situated – open - entity whose cognitive processes are not confined to the internal workings of the mind but are deeply intertwined with external tools, environments, and the social. A human is an evolving entity whose cognitive architecture is continually shaped and extended by internal (spaces) and external representations (instruments).

Imagination: The cognitive ability to form mental images, concepts, and ideas that are not directly derived from sensory input. It involves the capacity to envision possibilities, create representations of hypothetical scenarios, and synthesize new ideas by recombining existing knowledge. Hence, imagination is understood as a fundamental process in human cognition that

interacts with technological instruments and spaces, enabling the internalization and transformation of external representations into novel cognitive frameworks.

Representation: The act of depicting or symbolizing something, particularly in the context of spaces and technological instruments. There are two forms of representation relevant to the current context. (1) **Externalization:** the first form of representation. The projection of internal cognitive processes into external tools or artefacts. (2) **Internalization:** the second form of representation. The process by which external tools or behaviours become integrated into one's cognitive framework.

Spaces: Conceptual areas within the mind shaped and given form by interactions with external materials and technologies, as proposed by Bachelard. A "ground for thinking."; I could have used the concept of ground, but I prefer spaces, in the way Bachelard adopts it. A space signifies an expansiveness – where its boundaries are not clear, and, at the same time, a space – is only a space from the experience of a subject.

Imitation, language and the formation of thought

Introduction

Our social existence - our extensions - shape our consciousness¹; our relationships with our instruments and other human beings play a fundamental part in the constitution and formation of our cognitive architecture. Amidst escalating concerns within both academic and public domains, there is an increasing apprehension regarding how the advancement, integration, and reliance on technologies — such as artificial intelligence (AI) and language learning models (LLMs)— might diminish human cognitive capacities by reducing the resources necessitated for traditional cognitive efforts, potentially fostering cognitive laziness.²

In this paper, I aim to elucidate this transformation – how our cognition is shaped by our extensions, specifically our instruments – through a phenomenological lens. Phenomenological because I start the analysis from the subject's point of view – the one using the instrument; and since I am citing Bachelard this seems appropriate. I hope to start the discussion by first evaluating an example that practically illustrates that all instruments contain the potential to become a space - a “ground for thinking.”

Does the use of an isometric grid reduce engineering capabilities? An isometric grid is a graph paper with equally spaced horizontal and vertical lines at 30-degree angles often used to draw three-dimensional representations. Thus, it is a pre-established framework which designers can work with to create. However, you could argue that by using this instrument, a part of the total design process is eliminated: an architect or engineer does not have to draw or know how to draw an isometric grid by hand, and perhaps more extremely, they do not have to understand the internal

¹ Karl Marx, *A Contribution to the Critique of Political Economy*. ed. R. Rojas. (Moscow: Progress Publishers, 1977.)

² Petre Sorin Savin, Georgiana Rusu, Mihai Prelipcean, and Lucia Nicoleta Barbu, "Cognitive Shifts: Exploring the Impact of AI on Generation Z and Millennials," in *Proceedings of the International Conference on Business Excellence* 18, no. 1 (2024): 223-232.

mechanics of this grid before working with it.³ They use this space to achieve certain aims, AND simultaneously and consequently, their productions are shaped by the framework they are working with. Thus, this framework is adapted as it facilitates an efficient and consistent workflow where the designer can focus on the *creation* before learning how the *framework* in which he is creating works. This is the case with the adoption of any premade instrument; a part of the work is already done for the user of the instrument. The actual learning happens during and in the process. Thus, the thesis is also about *learning* itself; what does that mean?

Thus, again, would we say that adopting an isometric grid reduces our engineering capabilities or any of our cognitive abilities needed to design? We have omitted a part of the design process, where previously, that part was necessary labour to start the creation process. Or should we ask, somewhat provocatively, whether removing such a step has contributed to and, therefore, not inhibited the development of our engineering abilities? Both answers are possible depending on what part of the cognitive process you are focusing on and how you conceive of “cognition,” but it should not be assumed that it — the introduction of an instrument — necessarily impedes performance. Considering the triviality of this example, it appears unlikely that many of us perceive the introduction of the isometric grid as having impaired our engineering skills. However, intuitively, we assume that the introduction of an instrument, specifically novel instruments such as AI or LLMs, that removes a section of what must be produced impedes learning the full range of the production of this product.⁴

Moreover, this also presupposes a definitive understanding of what “learning” – what it means to learn - entails. Yet, this presupposition arguably rests on a constrained or *closed* interpretation of learning. In contrast, there are other possible interpretations of “learning” that might be understood in a more open-ended manner.

³ They learn the mechanics of this grid not by learning about the grid, but by working with it..

⁴ As seen in the concerns surrounding artificial intelligence.

Thus, while it might seem that becoming completely dependent on technologies, such as an isometric grid or a spellchecker, or more recently, the internet or AI, will be detrimental to our cognitive abilities, it is the pedagogy – our mentality - of these tools that is important. Thus, it is not the instrument that facilitates the impediment but our relationship with the tool. Moreover, while these examples might seem trivial, I suppose they are similar to the questions we are currently asking about using AI and its effects on our (general) cognitive abilities. If we imagine how one would respond before to the introduction of the isometric grid or a spellchecker, I suspect that the responses would be similar to the way we react to AI currently and identical to how we responded to the introduction of the internet previously.

Similarly, can we imagine, if we assume that language is a technology, as many thinkers have argued, and which we will argue below, *can we then imagine the cognitive “space” of a non-language user; that is, can we imagine how a person that does not have language thinks?* Here, I postulate that we cannot, as our cognitive space is dominated by and primarily dependent on language. Similarly, we cannot conceive beforehand how a specific technology will influence our cognition and how we will think in cooperation with that technology.

I propose that an instrument, such as an isometric grid, facilitates a context—a space—for thinking that can be used in the absence of the physical instrument. Similar to how instruments in previous examples reduce resources when creating, novel tools may also provide a framework—space—for generating thought.

As such, I write my thesis on how *the interaction with specific forms of technology, human-created artefacts, influences and determines our cognitive architecture and, therefore, its functioning.* Using the example of language as a technology, I will postulate that the advancement of technology and the accompanying possible “dependence” on a technological artefact is not necessarily detrimental to our cognitive faculties but instead propels the development of our cognitive architecture. Hence, I argue that becoming dependent on an instrument, which lowers the resources needed to achieve a task, supplements – completes – the development of our cognitive abilities, even in the

absence or breakage of these technologies, and in the process, changes the nature of that which we call cognition.

To illustrate this, I will first evaluate how and why mimetic and technological skills contribute to the extension of cognition. By exploring the relevance of imitation from an Aristotelian perspective, I evaluate how imitation facilitates and underpins representation, which I equate with technological skill. Next, drawing on Vygotsky, I will argue that the genesis of language as a technology can be traced back to imitation. Following Vygotsky's concept of the transition from external to *inner speech*, I will argue that this cognitive movement initially applied exclusively to language, can be extended to *all* forms of technology. Emphasizing this through Bachelard's notion that external materials-instruments shape the form of cognition, I will examine how material technologies contain the possibility for distinct ("cognitive") spaces. Moreover, through aligning with Derrida, I will investigate how these "spaces" undergo a process of erasure, becoming the perceived origins of their external antecedents. Finally, I argue that adhering to *a technical mentality*, as proposed by Simondon, will allow us to perceive cognition in a way that allows for its expansion.

Argument

1. Trajectory of cognitive evolution

The trajectory of human cognitive evolution highlights the pivotal role of technological innovations in transforming our intellectual and cultural landscapes. In the book *Origins of a Modern Mind*, the psychologist, neuroanthropologist, and cognitive neuroscientist Merlin Donald writes that humans have passed through *three major cognitive transitions*, each of which has left the human mind with a new way of representing reality.⁵ These three major cognitive transitions were signified and facilitated by three systems of memory representations: (a) *mimetic*

⁵ Merlin Donald. "Précis of Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition." *Behavioral and Brain Sciences* 16, no. 4 (1993): 737-748.

skill, (b) language and (c) external symbols. He argues that the externalization of our *memory*, hence the extension of cognition, has altered the cognitive architecture within which humans think; this alteration has resulted in a new way of intuiting the world. Thus, the introduction of language has altered how we perceive the world, similar to how other instruments, such as a microscope or telescope, have also altered our perception and thought process of the world. Hence, when we use technology, even in the absence of it, a residue of it remains in our psyche.

In the current paper, I adopt this division of memory representations but divide it into two phases while transposing memory to cognition: (a) mimetic skill and (b) technological or instrumental skill. In this formulation, technological skill includes both non-physical and physical instruments.⁶ This means that I argue and assume that technological skills include external and internal instruments, e.g., material language (writing and speaking) and thought-cognition. Hence, “technological” is a meta term for constructions that attempt to externalize human capabilities. By simplifying this division, I now propose that language is a technology, which is not a new claim, as various thinkers such as Nietzsche⁷, Deleuze & Guatarri, Marshall McLuhan, and Heidegger have all alluded that language is a tool⁸, which we adopt and consequently extend and augment our senses, altering our social environments and influencing thought, perception, and culture.

Next, I evaluate how and why these two memory representations contribute to the extension and outsourcing of cognition. I will begin by exploring the relevance of imitation from an Aristotelian perspective, then evaluate how imitation facilitates and underpins representation, which I equate with technological skill. This will be demonstrated using the postulation of

⁶ Language can be intuited as both a non-physical and physical tool.

⁷ Friedrich Nietzsche, "On Truth and Lies in a Nonmoral Sense." In *Truth: Engagements Across Philosophical Traditions*, ed. David Wood and José Medina, 14-25. (Malden, MA: Blackwell Publishing, 2005.)

⁸ In "On Truth and Lies in a Nonmoral Sense," Nietzsche reflects on the arbitrariness of linguistic symbols and how they shape human understanding. While not calling language a technology per se, he implies that it is a construct, a tool that humans use to navigate and structure their experiences.

language as a technology. Moreover, drawing on Vygotsky, I will argue that the genesis of language as a technology, as representations, can be traced back to imitation and that all technology emerges through this process of imitation.

2. Mimetic skill (1): What is its role in human learning and understanding?

The role of imitation in learning has been undervalued since Plato's conception of it⁹, for he limited imitation to acts of representation. Consequently, scholars followed Plato in relegating imitative behaviour to a faculty of lesser significance, viewing it merely as a form of social learning¹⁰ rather than recognizing it as a central process vital to developing and sustaining human thought and culture.¹¹ Nevertheless, recent advancements in psychology and neuroscience have rekindled interest in its role.¹²

In contrast to Plato, Aristotle emphasizes the importance of imitation and begins the fourth chapter of his *Poetics* with:

*the instinct of imitation is implanted in man from childhood, one difference between him and other animals being that he is the most imitative of living creatures, and through imitation learns his earliest lessons; and no less universal is the pleasure felt in things imitated.*¹³

First, it is suggested that there is an inherent desire and instinct or predisposition built into man, to such an extent that it makes him the most imitative of all living creatures; this is because it is through imitation that man *learns*; furthermore, accompanying the desire there is a universal

⁹ Christopher Shields, "Aristotle." In *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta and Uri Nodelman, Winter 2023 Edition. Accessed at <https://plato.stanford.edu/archives/win2023/entries/aristotle/> on 18 April 2024

¹⁰ Shields, "Aristotle."

¹¹ Scott R Garrels, "Imitation, Mirror Neurons, and Mimetic Desire: Convergence between the Mimetic Theory of René Girard and Empirical Research on Imitation." *Contagion: Journal of Violence, Mimesis, and Culture* 12, no. 1 (2005): 47-86.

¹² Garrels, "Imitation, Mirror Neurons, and Mimetic Desire: Convergence between the Mimetic Theory of René Girard and Empirical Research on Imitation."

¹³ Shields, "Aristotle."

pleasure to be felt when imitating, further moving man towards the act of imitation. Further, man does not only contain the potential to imitate man or animals but “things” in general, which can be, I argue, both living and non-living entities, physical and non-physical. Hence, imitation seems to be man's most distinguishing feature since he is the most imitative of all living creatures. This need and desire to imitate stems, or presupposes, a perpetual brokenness, a need for a supplement – for there is a desire for completion implanted in man – that drives him to imitation.

The pleasure derived from imitation can be interpreted in two ways: (1) that there is an inherent pleasure in performing the act of imitating and (2) that imitation relieves the users of unpleasant feelings and, as a result, facilitates pleasure. I adopt both interpretations interchangeably in the current work; the last interpretation aligns with what Aristotle writes about the term *catharsis*. For him, catharsis signifies the purgation of the emotions aroused in a (tragic) experience. The subject undergoes catharsis by having the *emotions* it experiences *purged*. Specifically, some argue that catharsis can signify (a) intellectual clarification, (b) purification (moral), and (c) purgation (medical)¹⁴; for our purposes here, when we use the term catharsis, we refer to (a) and (c). Thus, when a subject experiences *catharsis*, they can experience an intellectual clarification, but they also experience a biological purging of resources needed to manipulate something and, consequently, gain an increased capacity in judging ability regarding the subject or performance, which induced the increase of resources. Moreover, the distinction between biological and intellectual purging may be questioned, for they might be the same. Hence, catharsis might signify the purging of resources by outsourcing them towards the subject's milieu; that is, a part of the “thinking” occurs outside of the subject, which gives the subject an increased capacity to judge or manipulate the issue at hand.

¹⁴ Peter Simpson. "Aristotle on Poetry and Imitation." *Hermes* 116, no. 3 (1988): 279-291.

This process of offloading resources towards the environment can further be understood by the psychological theory of cognitive load (CLT), which posits that the information processing load induced by tasks on an individual's working memory can affect the ability to process material and, subsequently, the ability to build knowledge in long-term memory.¹⁵ Hence, the basic principle of CLT is that our limited working memory constrains our ability to manipulate and store information. Thus, analogous to catharsis, when an individual's cognitive load is overloaded, relief can be attained by redistributing some of the resources required for the task to the environment. This outsourcing reduces the cognitive burden, enabling the individual to achieve enhanced performance due to the diminished resource demand. This can be interpreted in line with catharsis as the lowering of the discomfort felt due to the high demands imposed by a task, and hence subsequently feeling relief or an increase in pleasure by lowering these demands.

Hence, catharsis is integral to how humans learn¹⁶: *to relieve pain, humans extend their cognition and resources towards the outer world when performing a task.* They must create a way to attain what they are aiming for, a way that was not there in the first instance. Therefore, catharsis is a *creative act*. As such, all learning results from a creative action, a reorganization and/or transformation, a constitution and the creation of a new ground on and from which to act.

Moreover, for Aristotle, *life consists of action, and its end is a mode of action*, not a quality.¹⁷ In line with that, all that is imitated is imitated with some action in mind, conscious or not. The imitation is performed because the imitator has some goal in mind due to a desire or a biological

¹⁵ John Sweller, "Cognitive Load Theory and Educational Technology." *Educational Technology Research and Development* 68, no. 1 (2020): 1-16.

¹⁶ Can learning even occur without imitation? What does learning mean? Is all learning connected to a reorganisation of creation?

¹⁷ Christopher Shields, "Aristotle." In *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta and Uri Nodelman, Winter 2023 Edition. Accessed at <https://plato.stanford.edu/archives/win2023/entries/aristotle/> on 18 April 2024

predisposition, and this desired state is successfully performed and present in the other (the imitated). Thus, for imitation to occur, *the imitator and the imitated are needed; one has to have a seed/desire/compulsion to imitate, and the other has to contain the action which one wants to imitate*, which relates to what Simondon thinks of *information*: “there is only “information,” when what emits signals, and what receives them, form a system.”¹⁸ That which emits must be in tune with that which receives; the receiver must be perceptive of these signals; and the sender must be appropriate – his information must contain the suitable form – to be received. *Hence, the imitator and the imitated form a system.*

Thus, imitation is inherently a social activity whereby actions which lead to specific outcomes are imitated to receive similar outcomes. The imitator does not necessarily need to understand the action he is imitating, but he intuits, subconsciously, that by imitating, he has a higher chance of achieving his aims. This action, imitation, stems from his displeasure due to not knowing or understanding how to accomplish his task and as such, he experiences an overload of stimuli. Therefore, imitation is one of the primal forms of extending and offloading one’s cognition to the environment. An individual could initially imitate another human-object-thing who has already mastered the action (mimetic skill) necessary to alleviate discomfort. As stated by Aristotle, imitation extends beyond human models to include nature, artefacts, concepts, sentiments, and affects, suggesting it is a fundamental aspect of human learning and becoming.

This leads to the consideration that independence from imitation might develop later. However, the timing of this transition raises questions: what constitutes “early” in this context? I propose that it could be interpreted in two ways: firstly, that imitation is most important at a young age; secondly, that imitation is most important when learning something novel, characterized by either an abundance of stimuli – that can be an abundance OR a total absence

¹⁸ Anne Sauvagnargues, *Artmachines*. (Edinburgh: Edinburgh University Press, 2016.) 65.

of stimuli regarding a thing to be comprehended.¹⁹ Moreover, it might also mean that we never let go of this aptitude to imitate, that it is an innate/persistent/perpetual tendency/strategy we adopt to learn and even organise perception. The further question would be: what then do we produce/make out of our imitations; that is, what stays or remains inside of us when what is imitated is not present; thus, how do we *learn* from imitation?

In the next section, I elucidate that the second memory representational skill, technological skill, is a result and consequence of the first representation skill, imitation. The innate inclination towards imitation not only supports but also underpins the representation of the imitated, which then crystallises into instruments. To demonstrate this evolution, I will examine the role of language, drawing on Vygotsky's, to showcase it as an exemplary technological instrument.

3. Technological skill (2): imitation to representation

Having established how imitation underpins early cognitive development and sets the groundwork for sophisticated memory representations, we now examine Vygotsky's perspective. This transition allows us to explore how these mimetic skills lead to the emergence of instruments, with a particular focus on language as an exemplary instrument. Vygotsky provides insights into this evolution, illustrating the transformation from basic imitation to the sophisticated representation and use of language and its significant role in shaping human thought and action:

*If at the beginning of development, there stands the act, independent of the word, then at the end of it there stands the word which becomes the act, the word which makes man's actions free.*²⁰

¹⁹ Both an abundance of images, and the total lack of an image, result in a creative act, where the individual reorganises his perception to be able to see at least one clear image.

²⁰ Lev S. Vygotsky, *Thought and Language*. (Cambridge, MA: MIT Press, 2012.)

In this assertion from his book *Thought and Language*, Vygotsky highlights the evolution from pre-linguistic stages of human development, where actions and experiences precede the understanding and usage of language, to later stages, where language becomes the driving force behind thought and action.²¹ Assuming that language was not present at the human genesis, we can state that, initially, human cognition is driven by direct interactions and experiences without the mediation of language. Nevertheless, as we advance from these fundamental cognitive processes to more sophisticated forms of thinking, the function of language becomes a pivotal conduit, influencing not only how we articulate ideas but also, in a profound manner, the very structure of thought itself.

Thus, the pre-linguistic man does not think in language; we cannot even comprehend or imagine how pre-language individuals "think" and whether we would even call that thinking. Regardless of how we try to conceive of it, our imagination necessarily traverses through language and attempts to conceive of this "cognitive architecture" with language; hence, we cannot *a priori* conceive what this form of cognition would be like, and neither can we imagine how it would work, for language has gained dominance in our thought. This dominance is transparent and/or seen as a default part of our cognitive architecture. However, the same is true for the pre-language individual; they might also not be able to imagine the possibility of a mind infused with language and what such a mind is capable of. Thus, as development progresses, language emerges not just as a tool for communication but as a fundamental instrument for thinking and planning, transforming actions from mere reactions to the environment into calculated and reflective behaviours. The transition from an instrument to a mode of thought is what we are investigating.

²¹ Vygotsky, *Thought and Language*, 150.

Vygotsky's perspective underscores the transformative power of language in liberating human actions, allowing for abstract thinking and planning beyond immediate contexts. This aligns with the concept of *catharsis*, for language induces and facilitates a reduction of the resources needed to communicate-compute. This reflects a typical pattern in the evolutionary trajectory of the humanities: introducing new technologies that decrease the resources required to compute tasks, as proposed by Merlin Donald, prompts a reorganization of the human cognitive and biological frameworks.²²

Another similar example of a reorganization induced by extending resources to the environment or an instrument is the *cooking hypothesis*²³, which suggests that a pivotal shift in the evolutionary trajectory of early humans occurred with the advent of cooking. This practice "outsourced" aspects of digestion, transforming raw materials externally before ingestion, which streamlined the internal digestive process. However, rather than rendering our ancestors unable to digest by themselves, this change significantly reduced the anatomical structures dedicated to digestion.²⁴ Hence, this shift was a transformative adaptation: reallocating energy from digestion to other functions. It is thought that our ancestors experienced an acceleration of cognitive development, often attributed to increased energy availability for brain growth. Thus, cooking catalysed a significant evolutionary leap, enabling early humans to cultivate more complex brains and, by extension, more intricate social structures. Therefore, *the cooking hypothesis* aligns with and is a result of the concept of catharsis as interpreted before, in this sense, a purgation of the excessive amounts of biological resources needed for digestion, consequently leading to a creative reorganization of human physiology and, indirectly, his cognitive architecture.

²² Merlin Donald, "Précis of Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition." *Behavioral and Brain Sciences* 16, no. 4 (1993): 737-748.

²³ Kim Sterelny, "Minds: Extended or Scaffolded?" *Phenomenology and the Cognitive Sciences* 9, no. 4 (2010): 465-481.

²⁴ How would we react today if someone were to ask: would you like your digestive system outsourced?

Thus, with this example, we demonstrate again that catharsis is a creative act catalysing reorganization and transformation, be it in the biological (digestion) or the cognitive sense (language): purgation or cleansing is a reorganization, and a reorganization is a creative act. Hence, it is the act of creating a new space, a new ground (or a biological configuration), from and through which to think.

Thus, in line with catharsis, language (material) induces relief-pleasure in the subject wielding it. Utilizing *words* means to lighten, to remove the burden encountered when attempting to communicate by outsourcing it to the external world in the form of spoken or written words, which allows us to judge the thing to be communicated from a more detached perspective, for we can put our instructions, actions, intentions onto paper (or speech), and evaluate and manipulate these “frozen” acts using the additional cognitive resources that have become available. Similarly, the philosopher of science, Bachelard, in his book *Poetics of Space*, asserts that *our words can think for us*²⁵, and I assert that we can do the thinking in cooperation with them; they do a part of the thinking in themselves, and we gain the ability to think on top of theirs due to the increased resources available; this is what the CLT postulates. Hence, every utterance of language in a communicative manner serves as a relief, and since it aims to relieve, it may be pleasurable, analogous to how imitation, as induced due to catharsis, is pleasurable.

This shift illustrates the integral role of the freeing of resources by language in cognitive development, suggesting that linguistic development enhances cognitive capabilities and promotes a higher level of freedom in human actions and thoughts. At the same time, it illustrates how we equate the introduction of language (analogous to the cooking hypothesis) as a necessary aspect of human (cognitive) evolution, simultaneously showcasing our dependence on this technological invention. In both of these examples, the freeing of “resources” and a decrease

²⁵ Gaston Bachelard, *The Poetics of Space*. Translated by Maria Jolas. (Boston: Beacon Press, 1964.) 39.

in (repetitive) actions needed to achieve specific tasks is crucial to cognitive (and biological) evolution. Thus, it seems that managing resources is an integral part of human evolution, for if a technological invention saves resources and if these actions are expected to be repeated, then we will be influenced by that instrument, facilitating a creative reorganization.

4. From imitation to representation

4.1. Externalization: representation as instruments

Thus, returning to imitation: at a point in the development of humans, we imitate actions, where the imitation is focused on the direct and immediate context, but as a result of imitation, we create a *representation* of the actions, which we here equate with technology, making technology something that finds its ultimate origin in imitation. In our example, language refers to the act(ions), relieving the user by substituting the physical actions he intended to take with symbolic actions, encapsulating these into signs. Therefore, we also say that all instruments, and thus all technology, are a representation or externalization.

In this sense, the word is a representation-externalization of what was previously imitated; in other words, it is the imitation of the actions that facilitate the representation of actions (language). This is in line with what is written of Aristotle's mimesis: “*as we engage in more advanced forms of mimesis, imitation gives way to representation and depiction.*”²⁶ While this was written in the context of a tragedy, it nevertheless applies to our current context. Language, like tragedy, facilitates catharsis for its viewers since they can be relieved of the mental resources needed to think about their lives. As such, tragedy, like other technological instruments, provides a context—a background—for thought; it provides a way for catharsis to invoke a reorganization.

²⁶ Shields, “Aristotle”.

4.2. Internalisation: representation as spaces

Next, I argue that this depiction, this transformation from imitation to representation-externalization in the form of external instruments, similarly occurs in the non-physical or cognitive realm. Once we imitate, we create more universal versions of what was imitated internally: *internalisation*. For example, the internalisation of language, that is, when oral (speech) and physical (writing) words are "imitated" and consequently form a space in the mind which is more universal, less confined and more expansive than its precursor, and which serves to enlighten the audience by allowing us to engage in computations, now without necessitating uttering the words: an "inner speech"²⁷, which we will here refer to as "thought/thinking", "thinking-in-language", or "cognition."²⁸ Vygotsky postulates this: the creation and formation of "thought/thinking" is an internalisation of "language" in its material forms. Other thinkers, like Olson²⁹ and Dennet, affirms this and adopt a similar proposition; Dennet writes:

*Thinking — our kind of thinking — had to wait for talking to emerge.*³⁰

Accordingly, I contend that language is not merely a tool for communication but *a fundamental framework* that structures and enables "thought" as we know it. This is not unlike what Gilbert Simondon,³¹ in his essay "*Technical Mentality*," writes on tools: "the object is not only structure but also regime."³² This suggests that the object not only is the form but also facilitates the form; it not only limits but organises, contains and enables a vision; it facilitates a specific way of thinking that is only possible with and through itself. For example, conceived in this manner, language is not only a communication tool but also organises communication and thinking. With the

²⁷ Vygotsky, *Thought and Language*, 130.

²⁸ Vygotsky, *Thought and Language*, 130.

²⁹ David Olson, *Mind on Paper*. (Cambridge University Press, 2016.)

³⁰ Daniel C. Dennett, *Kinds of Minds: Toward an Understanding of Consciousness* (New York: Basic Books, 1996). 30.

³¹ We will elaborate on Simondon later in the thesis.

³² Gilbert Simondon. *Being and Technology*. Edited by Alex Murray, Arne De Boever, Ashley Woodward, and Jon Roffe. Edinburgh: Edinburgh University Press, 2012. P.13

development and introduction of language, humans could *represent* objects, events, and concepts symbolically-internally-mentally, detach thoughts from immediate and physical circumstances, and consider the not-here-and-now. However, as previously described, before we represent, we must first have imitated; thus, we gather that we have internalised *external* language and, consequently, created an *internal language*³³, which we now use to navigate the world. Therefore, this aligns with what we have stated on Aristotle, that *imitation precedes representation* and that *all imitation is done with an action in mind*.³⁴

This is the main argument postulated in *Thought and Language*, where Vygotsky accentuates the crucial role of the external milieu, encompassing speech and writing, in cognitive evolution. He further delineates the transmutation from external to internal language as vital for developing mental functions. Hence, he proposes a framework that suggests a *symbiosis* between the constitution of language and cognition, emphasizing the significance of the social in the developmental trajectory of cognitive faculties.

Importantly, according to Vygotsky, inner speech is not merely an inward reproduction of external speech but a functionally transformed, condensed, and simultaneously more essential or universal version of language suited for private use.³⁵ Thus, it moves from the social to the individual. In our terms here, it is the creation of a specific “space” through which the individual will be able to think. This echoes a statement on consciousness by Karl Marx, whose ideas significantly influenced Vygotsky:

*It is not the consciousness of men that determines their consciousness; but their social existence [their extensions] that determines their consciousness.*³⁶

³³ Vygotsky, *Thought and Language*. 140-150

³⁴ Shields, “Aristotle.”

³⁵ Vygotsky, *Thought and Language*, 150

³⁶ Marx, *A Contribution to the Critique of Political Economy*, preface, 2.

This is our argument taken to the extreme: *our consciousness is fundamentally constituted by our externalisations*. It does not pre-exist the externals; it is moulded and given form by them. Therefore, our social existence, which is our relationships with other beings, objects-things, and instruments, determine, constitute, and form what we call our consciousness. Hence, it is the extensions of man, thus their social extensions-relationships, which determine their consciousness. It is the conceptual AND material creations of man that will shape their perception and experience of Being in the world. Therefore, we must include technology in man's social existence; consequently, we must include technology when speaking of the evolution of consciousness. Echoing Merlin Donald's suggestion that "cognitive evolution is not yet complete", where the externalization of cognition/memory has altered the actual (biological) cognitive/memory structure with which humans think, changing the role and the way the human brain deploys its resources.³⁷ Aligning with what we have previously said about the internalisation of the external, our cognition as we perceive it, as given form by language, is a product of the external— a tool – which first emerged as part of our social existence.

Thus, the production and creation of material language, like the externalization of digestion, have resulted in an excess of resources, which can now be utilized on top of words, for every word contains a set of instructions, actions, and references, which costs more resources to communicate when not in the possession of language. Here, we suggest that the physical production of words can be interpreted as a cognitive burden, where the internal production costs fewer resources than the external production. This space, and all internal spaces, is constituted with repetition³⁸ in mind, meaning that the individual anticipates the repetitive performing of the required actions, and therefore, a space - an environment - needs to be

³⁷ Donald, *Precis of Origins of the modern mind: Three stages in the evolution of culture and cognition*, 1.

³⁸ Gilles Deleuze, *What is Grounding*. Ed. Tony Yanick, Jason Adams & Mohammad Salemy, Grand Rapids, (MI: K& Publishing, 2015.) 175.

constructed that facilitates the repetition of these tasks; this is not done un-intentionally but *is* passively created out of a necessity, due to catharsis, as a result of the high cognitive load experienced by repeatedly having to perform linguistic manoeuvres. This high load, in turn, is relieved/reduced by the creation-constitution of this space. (Deleuze states that the question for the necessity of a ground, which can be partly equated with what we mean by a "space", is the same question for *the necessity of repetition*.³⁹ A space is a shelter from the increasing demands of repetition of tasks; hence, a space is pleasurable and comforting.) This is not unlike our reasons for building "external" spaces; they, too, are built with a task in mind that will be consistently repeated. For example, *a storage*: the content of what is stored influences how the storage gains form - it determines what the place is – this storage, in turn, influences *what* is stored and how it is organized. Hence, "inner speech" is a space constituted as a consequence of the cathartic act of using "physical" words.⁴⁰

In line with Bachelard, these spaces are like a house from and through which we think, echoing Heidegger's conception of "language being the house of Being."⁴¹ I have attempted to describe this until now: *a house that provides protection lowers displeasure from all the dangers outside*, analogous to how imitation lowers displeasure. Similarly, language (speaking and writing) offers a reduction of displeasure encountered when unable to communicate, and the space of language (thinking) provides the comfort, the shelter, away from the displeasure of all that is felt and directed towards us, to solve a problem that requires more resources than what is available to a human without this space. The ability to compute and perform actions in a specific space is the comfort: *the ability to manipulate words without speaking or writing them*; thus, the facilitation and the

³⁹ Deleuze, *What is Grounding?*, 176.

⁴⁰ Vygotsky, *Thought and Language*, 200

⁴¹ Martin Heidegger, "Letter on Humanism."

creation and incorporation of an adequate cognitive space is a part of the solution to our displeasure.

However, the way that I differentiate from Vygotsky is that, for him, language is the root of cognition, whereas for me, thinking (thought-in-language) is the residue of our interaction with a *specific* technology: language. Hence, I adopt his conception of the transition of language to thought and apply it to technology in general. Therefore, I suggest a transition (development) from an external (instrument) to an internal instrument (spaces). Thus, whereas he moves from the creation of material language to the creation of thought, I move from the creation of technology in general to the possibility of different forms of thought. Thus, all technology, like language, is part of *our social existence*, and they similarly contain the possibility to become a part of *our private existence*; they contain the possibility to become (a part) of our consciousness. This aligns with the thesis proposed by David Olson, a reader of Vygotsky, in his book *A Mind on Paper*,⁴² where he postulates that writing, thus material language and hence an instrument, contributed to a new consciousness, that of thinking-in-language or “thought” as we know it.

5. A space as a non-form

Thus, creating an internal structure, a space, through internalization, results from decreasing displeasure by engaging in imitation to achieve specific ends. Hence, a space, or a mental structure, is the ultimate product of imitation; it is the representation of that which was imitated in a more universal and expansive form; this form is more specifically a non-form; it is a dispersion of its identity, that facilitates an opening; that becomes an opening precisely due to the diffusion of its form.⁴³ This seems to be the law or property of the mind, where everything that is internalized must necessarily take the form of the non-form; thus, everything must transition to a non-thing (source), echoing Hegel, who states that “everything finite is its

⁴² Olson, *Mind on paper*, 242.

⁴³ Jacques Derrida, *Of Grammatology*. (Baltimore: Johns Hopkins University Press, 2016.) 9.

sublation”;⁴⁴ because it contains the seeds of its negation and preservation within itself; finite things are limited, contingent, and dependent on other things, constantly changing and becoming something else. Therefore, finite things are always sublated by something higher or more universal, which cancels both their particularity and their physicality, yet preserves their essence. Thus, every material artefact contains and is also its (own) sublation, facilitating the emergence of a transcendent form of itself. Hence, a tool such as a pen contains in itself the potential to negate itself – its particularity – since its non-particularity (space of pen-like-mannerisms) can facilitate another artefact that can transcend the pen, which contains its (previous) essence, but yet is something else.

Thus, anything imitated can be represented internally (mentally) or externally (physically). The rigid boundary between these two "dimensions" should be softened, as the spaces developed by representation extend outward AND inward simultaneously: space is independent of dualistic dimensions, such as mind or matter, concept or instrument; space is both a concept and an instrument; think of how (the space of) language has extended both inward and outward, where language is now something both physical and non-physical at the same time; both an instrument and a regime.

Imitation thus results in the constitution of internal "spaces"; which means that "a space" (as we intuit it) is the (ultimate) representation of an imitation. Moreover, I will postulate that all spaces are (internal) instruments, like the external instruments we constitute, where both types of instruments result from a representation, that is, externalization - or internalisation of a thing that was imitated. Thus, what we imitate (grounds subsequent representations) can gain form in a representation, where both internalisation and externalization are a similar manoeuvre; both are forms of depiction and the result of creative action; they are both a creative reorganization of

⁴⁴ Julie E Maybee, "Hegel's Dialectics." In *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Winter 2020 Edition. Accessed at <https://plato.stanford.edu/archives/win2020/entries/hegel-dialectics/> on 14 February 2024.

something that was imitated, as a result of catharsis. Hence, *internalization and externalization are both forms of representation*; all representations are instruments, which means that physical and non-physical representations (external and internal spaces) are instruments. Internalisation is a representation that goes “inward,” whereas externalization goes outward, and both adopt the form of their respective destinations. Thus, externalization necessarily becomes more finite, whereas internalisation becomes more infinite. Hence, internal spaces, like external instruments, are constituted for instrumental reasons that are expected to be repeated consistently because they lower resources for a specific task.⁴⁵

So, we end up with a sequence that looks like this: (0) from the imitation of actions due to displeasure to two forms of representation: (1) either the internalisation of these actions (spaces) OR (2) the externalization of these actions (instruments). Thus, internalization (spaces) can now facilitate representations externally (e.g. the space of language can produce written and spoken words); (2) externalizations (instruments) can now facilitate representations internally (e.g., an instrument can facilitate a space in the mind). Thus, externalization necessarily becomes more concrete, whereas internalization becomes more universal. If we go back and reevaluate where this loop of thinking starts, it becomes hard to detect where imitation begins and where representation ends; hence, there is no rigid distinction between imitation and representation, which suggests that imitation itself already was a representation. Which is what Merlin Donald already said: imitation and technological skill are both forms of representation. It are our representations that are crucial to how we learn or create, thus how we internalise or how we externalize.

⁴⁵ Deleuze, *What is grounding?*, 175.

5.1. Space as the origin of the origin, beyond dialectics

We now move to Derrida, with whom we ask what remains when an instrument is internalised; or how does *our representation contribute to learning*? Thus, how is cognition transformed before being supplemented with a space, an internal instrument? How do we perceive “thought” as language and not something else, and why is the possibility of another mode of thought not clearly visible? Thus, I attempt to evaluate why “thinking” only occurs in the space of language. Next, I will explain why “cognition” changes when introducing a supplement.

In the absence of the instrument, I propose that what remains with us is a trace – which is a residue, a supplement, to the external instrument. It completes the instrument – it is intimately connected to it, where the supplement constitutes what the original instrument entails. Thus, a (internal) space is the internal equivalent of a finite (external) instrument. This aligns with Derrida’s notion of a *trace*⁴⁶: it is the part played by the radical (internal) other within the structure of difference that is the sign⁴⁷:

*the trace is the mark of the absence of a presence, an always already absent present, of the lack at the origin that is the condition of thought and experience.*⁴⁸

Thus, whereas *Heidegger’s* Being might point to an inarticulable presence, Derrida’s *trace* is the mark of the absence of a presence.⁴⁹ Thus, while Heidegger says that language is the house of Being⁵⁰; Derrida would say that language only seems as if it is the house of being. Other (type of) houses were possible, and this is not the definitive house of Being. This house results from the

⁴⁶ Derrida provides us with the solution to the problem encountered in Heidegger, of *what remains* after our interaction with a material technology. For Heidegger, there is actually just one technology; which is a metaphysical property; you could say that it is a posture.

⁴⁷ Derrida, *Of Grammatology*. 60.

⁴⁸ Derrida, *Of Grammatology*. 60.

⁴⁹ Derrida, *Of Grammatology*. 60.

⁵⁰ Martin Heidegger, "Letter on Humanism." In *Basic Writings*, ed. David Farrell Krell, 189-242. (San Francisco: HarperSanFrancisco, 1993.)

emergence and subsequent erasure of a specific technology. However, it might be so that the nature of thought, as we know it, is only so because it is a residue of *language*; other residues of other internalisation, might not be visible; thus, thought as we know it, only exists in this form due to language, and other internalisation, other spaces, will not appear in this form, which is a form that is in some way perceptible to us: we can perceive ourselves thinking.

Consequently, it seems all thinking originates from this space of language, this transcendental arche, as Derrida would call it. This is the same move I am postulating: moving from a material instrument to an immaterial space. It is the sublimation of the finite into the infinite.⁵¹ A movement toward the infinite and an erasure of its physicalness – its presence.⁵² This movement toward the infinite is itself a preservation; the tendency to internalize is a tendency to preserve the finite in the form of the infinite; it is a making sure of nature that what is finite is not lost, that its essence is somewhat preserved.

There is no speaking of an original without the supplement – the antecedent! Hence, what we perceive as cognition, thought, currently, is only perceived as such because it was supplemented with the “space of language”; it is the supplement that transforms the original, where the original form, as an original, is invoked due to the existence of the supplement. Thus, the introduction of language to consciousness has fundamentally determined what we perceive as “thinking”. This is what I attempted to explain in the beginning: for a mind infused with language, it is impossible to imagine the internal workings of a mind without language (and vice versa).

A trace, or a transcendental arche, must make its necessity felt before letting itself be erased⁵³; it must comply with its necessity and erasure. Thus, in our terms, that which is

⁵¹ Julie E. Maybee, "Hegel's Dialectics."

⁵² Derrida, *Of Grammatology*. 45-60. Chapter 2.

⁵³ Derrida, *Of Grammatology*. 45-60.

internalised, which becomes a space, loses its form, identity, and hardness when it is internalised. It is now expansive, more open than the external, and by radically opening itself up, it erases itself; it becomes a non-origin, or the origin of the origin. Using our example of language, we can think of how the literary space, “*inner speech*”, now seems like it is the origin of (external) language; it seems as if all language comes from this expansive, formless space, while this space, this non-origin, which is now the origin of the origin (of language in general), only gained this position, in retrospect.⁵⁴

Accordingly, inner speech/thought could have only emerged out of dispersion⁵⁵; the language must necessarily traverse space, and this is not an accidental trait but the mark of its origin. It necessitates dispersion, that is, its translation into a non-form, what we here call a *space* — and it is due to the existence of this space that "external" language materialises; *that is, that seems as if all external language is “produced” out of a void, that is the mind; for internal language does not have strict boundaries, or limits, making it hard to notice when it starts or stops, but is clearly present. Its origin depends on the second moment; external language becomes (itself) due to the existence of internal language – hence, external language now has an anchor point in internal language; it is where all external language “seems” to originate from⁵⁶: Sentences now refer to thoughts, and particulars signify universals.*

However, I am postulating that this procedure can occur for other instruments or technologies, too. It should not be exclusive to language; it is what happens after and beyond sublation. If language is a technology, why would this movement be exclusive to just one specific technology? This seems like a privileging of language, as Heidegger⁵⁷ and Derrida do while being blind to other potentialities. Yet, by using their conceptions, we conclude that other “modes of

⁵⁴ Derrida, *Of Grammatology*. 45.

⁵⁵ Derrida, *Of Grammatology*. 45-60.

⁵⁶ Derrida, *Of Grammatology*. 45-60.

⁵⁷ Martin Heidegger, "Letter on Humanism."

thought” and other forms of “cognition” might be possible and that language might not be the only *house of Being*.

5.2. The opening up to other spaces

The spaces, the transcendental arches, are impossible to master; Derrida suggests that the field is unknowable theoretically – not only empirically.⁵⁸ *They are the sublimation of the finite into the infinite.*⁵⁹ For example, we cannot master *the space of language*; we become aware of its expansiveness, openness, or incompleteness; its property for the openness is the reason why we cannot master it, analogous to how we cannot ever state that we have mastered the human imagination (or language) since we do not know the extent of what the human imagination is capable of.

Nevertheless, we intuit that there is a space of language in the mind, which is distinct from – the total span of imagination - but intricately connected to it and does not have clear boundaries.⁶⁰ Yet, we cannot accurately tell if and when the space of language starts and transitions into another space. This aspect of our cognition, which can, to some extent, be perceived, is a residue and, hence, a constitution of the emergence and interaction with material language.⁶¹

Hence, the ability to perceive *thought*, thus “to think,” merely represents an aspect of the mind.⁶² Kant writes that it is permissible to think of representation as cognition if this cognition is a principle for determining the object practically, that is, what the idea of the object ought to become for us and our purposive employment of it.⁶³ Hence, we could not perceive " thought "

⁵⁸ Derrida, *Of Grammatology*.

⁵⁹ Julie E. Maybee, "*Hegel's Dialectics*."

⁶⁰ Derrida, *Of Grammatology*.

⁶¹ Derrida, *Of Grammatology*.

⁶² Immanuel Kant, "Extracts from Critique of Judgment." In *The Continental Aesthetics Reader*, edited by Clive Cazeaux, 2nd ed., (London: Routledge, 2011.) 23.

⁶³ Immanuel Kant, "Extracts from Critique of Judgment." 23.

without external material language. Thus, it is the externalisations that shine a light on the potentialities of the mind.

Moreover, since it is a presentation, it is only a fraction, an expression of the scope and capabilities of cognition. This perceptive form of thinking is reductive and invokes the illusion that it is the *total of cognition*. Thus, whereas Heidegger writes that language is the house of being, I would contend that it is merely a house that is visible and, therefore, privileged. As such, thought is the extension, the supplement, of language—a technology that facilitates the emergence and perception of the process we call thinking.⁶⁴ Therefore, thought, inner speech, supplements and “completes” writing and speaking, and by completing them, it becomes *their origin*; thus, it seems to be the origin of all language, and it functions as such, but its emergence was not primary. (“Complete” is here meant tentatively, for whenever completion has occurred, cognition opens itself up to being expanded again.) From the moment it emerges, it (seemingly) influences and organizes all thought and expression of language.

6. Imitation presupposes an openness

From our inquiry thus far, we have learned that humans tend to imitate, which signifies an openness or incompleteness of its current state. Hence, in imitation, there is a preservation of the current state, a stable part, and coupling and welcoming of another state facilitated through an open or unstable part. Thus, imitation presupposes openness, a brokenness inherent in humans. Hence, complete dependence (on another state) is only a problem if we assume that the human is a closed being, that is, a being that is not open and does not necessitate externals to be(come); that does not necessarily necessitate extensions to become aware of itself.

Man has consistently been shown to integrate with technological inventions, such as language or its external digestive system while retaining their openness. Even language, which is

⁶⁴ This rests on the assumption that written language emerged before spoken language.

one of his inventions, bears within itself the dialectics of open and closed⁶⁵; it closes through meaning and opens up through poetic expression, which signifies the breaking of itself. All that is internalised mirrors the openness inherent to the properties of the human mind; thus, what is internalised inevitably and necessarily must adopt the form of openness, which is the absence of a form. This opening and closing depends on part of it being permanent and consistent while a part is up for replacement or erasure. Thus, man and his technological inventions contain numerous movements of opening and closing, frequently inverted, so we adopt the following formula: *man is a half-open being*⁶⁶; that is, a being that perpetually opens itself and integrates with its supplements, where the supplements, in turn, (re)constitute and (re)form what “man” is. Thus, following Derrida, we can state that it is only through externalization that the origin becomes an “origin.” If humans (and their minds) are a becoming, then they must be radically open, for how can one become more than one already is if you do not integrate - the external into the internal.

Hence, we end up with two options: (1) we are either becoming aware of the potential of human cognition OR (2) we are actively constructing what human cognition is through our externalization and subsequent internalization. I have no preference for either of these suggestions. However, the first one is harder to speak of since we cannot speak of anything regarding the scope of human cognition, and this is also the point I am stating in this thesis. The second one allows us to speak of specific possibilities arising from specific technological inventions. In both cases, what occurs practically is an expansion of human cognition, whether due to fulfilling a potential or constructing the capacity for that potential.

This aligns with what we have shown with language (writing) as our example of externalization; writing can be seen as an extension of the mimesis of actions, facilitating the

⁶⁵ Bachelard, *Poetics of Space*, 222.

⁶⁶ Bachelard, *Poetics of Space*, 222.

constitution of internal speech or thought as we know it. Where we have shown that it are the externals which give identity and form towards that which is extended – its origin. Hence, it is through writing that we gain an awareness of the potential of human cognition, OR, writing, as an extension, and therefore a technology, actively contributes to that which we call human cognition – thinking.

Language and writing seem essential to many of the cognitive abilities we value and privilege the most. Therefore, I would argue that this example of language is not merely incidental; instead, it stands as one of the most intuitive illustrations to elucidate the matter at hand: *that interacting with a technology can facilitate a space, analogous to the space that thought is*. Since, following Vygotsky, *thought* is the space constituted as a result of our consistent interaction with a technological artefact.

6.1. Towards a technical mentality.

Thus, at the beginning of the current paper, we spoke of the tendency to imitate, which presupposes this radical openness which we will now assess. The awareness of this radical openness is essential for the proliferation of human (cognitive) evolution. The awareness and the facilitation of this state of being, a being that is half-open and awaiting its supplementation⁶⁷, is in line with what Simondon termed a “technical mentality”⁶⁸; a technical mentality can be conceived of as a certain “posture” we can have regarding the human and their productions. We can further understand this by way of an example: to construct a building in line with a technical mentality means to conceive of it as able to be enlarged, continued, and amplified without disfiguration or erasure⁶⁹. This means that the building is constructed from the ground up with its opening and, thus, its expansions in mind, without knowing what or how they will take form.

⁶⁷ Bachelard, *Poetics of Space*, 222.

⁶⁸ Simondon. *Being and Technology*. 1-13

⁶⁹ Simondon. *Being and Technology*. 2

Hence, its breaking or opening up is anticipated, for a technical reality lends itself to being continued, extended, expanded and transformed.

Our technological example in this paper, language, can similarly be conceived of as such, but my primary intention was to conceive of cognition in terms of the technical mentality⁷⁰; cognition as a radically open faculty, a faculty that is not completed, but open to supplementation; a becoming. Hence, dependence is not the proper term for a fundamentally incomplete being, a being that fundamentally necessitates the Other(s) (things). A part of it is stable, repetitive, and another part of it, or the absence of a part, an opening, is a welcoming or a possibility of coupling with an Other; this is the inclusion of and the facilitation of the possibility for a difference. These couplings can sometimes be permanent, but they can never complete the radical opening; they partly fill in the opening while the opening remains. They can also be impermanent, that is, they can break, which implies that the breaking, the failure, is decisive for understanding this "machinic operativity".⁷¹ The machine, an assemblage of Beings-things-entities, consistently fails its functioning; its failure is part of its operativity. Our example of language as a technology always fails or breaks, yet we know and anticipate its failure.

We repeatedly experience the breaking of language in philosophy, where most philosophical problems are investigations into the breaking and the limitations of language; hence, philosophy, as a discipline, functions and evaluates in and on the verge of the breaking. Therefore, we intuitively adopt a technical mentality when thinking of language since we know that it is a property of language to break. Thus, even though we know that we anticipate it and work with the breaking; and as we have proposed, it is the breaking that is essential to the development and expansion of language, and therefore all technology; it invokes reflection,

⁷⁰ Extended cognition theories still assume that the human-mind is the initiator, orchestrator; that there is a start, a beginning, from which to extend.

⁷¹ Sauvagnargues, *Artmachines*. 193.

disruption and creation, which results in the continuous expansion and transformation of language. Hence, its breaking is not a negative thing; *it is not a flaw, but a feature*, and therefore must be seen as a radically positive thing: an opening up of possibilities. This posture we have or ought to have with language, can be applied to our relationships with other technologies and our cognition. For it is also the breaking and disruptions that will further cultivate our technological inventions.

Therefore, cognition itself is an assemblage – a machine – an integration between the producer and its production; between man and language; man and technology; where the product leaves something of itself in the producer.

If, technology is a representation, and imitation was a representation itself, so too is cognition, hence cognition is itself a technology. Where imitation and cognition are both forms of representation, invoked due to a certain tendency to represent, in order to achieve certain aims. Hence, we should think about how we want to think with the representations we create.

We should move on from “cognition” as a thing that is already defined or as a thing to be understood to a cognition that is constantly created, that is a flow which can be directed, where we perceive it as a process where we can accelerate and influence its development; a perpetual becoming. Conceiving cognition in that manner has practical implications. We would then open up the discussion of “how we can develop cognition” AND OR “what instruments we should build to achieve a cognitive (re)evolution.”

Hence, our perceptions will be influenced by our mentality; our posture, where we perceive ourselves as radically open, perpetually welcoming supplementation. Consequently, it will allow us to perceive “cognition” differently; for we will intuit how expansive consciousness/cognition is, that it is not finite, like our external instruments, but radically infinite, containing the possibilities for various spaces. We could say that we, to some extent, already intuit the expansiveness of consciousness, but now, the awareness of this expansiveness will have practical implications.

Moreover, this transition to an integrative form of cognition demands a re-evaluation of both what we think of as instruments or artefacts, and of our “cognitive architecture” or cognition, for these things/others are as much a part of our cognition as our mind is; they are not external to us, but instead constitute us; as we said, it is the supplement that constitutes the origin, where the supplement (might) becomes the origin of the origin. Thus, even though we perceive them as supplements, which is merely an illusion of *perspective*, they enter our cognition and then erase themselves, to only leave a trace: an absent presence. Hence, I suggest moving from words like “our” and “my” when we speak of cognitive abilities or a cognitive architecture. It seems that there most likely is no thing as a “local” or “individual” cognition – (all) cognition is necessarily coupled to a specific ground-space of thinking. Hence, cognition is an expansive force – and thought – is only a moment – a specific representation – in this assemblage.

Conclusion

In this paper I inquired how the interaction and relationship with specific forms of technology, human-created artefacts/instruments, influences our cognitive architecture and its functioning, by building on and extending the theories of Aristotle, Vygotsky, Bachelard, Derrida, and Simondon. Using language as a paradigmatic example of technology, I argued that the advancement and potential dependence on technological artifacts are not detrimental to our cognitive properties but instead propel the development of our cognitive architecture. Therefore, becoming dependent on an instrument, which lowers the resources needed to achieve a task, supplements – completes – the development of our cognitive abilities, even in the absence or breakage of these technologies, and in the process changing the nature of that which we call cognition.

Using Aristotle, I began by describing how imitation is critical for learning. Here I argued that imitation is a result of catharsis and is the most fundamental form of extending one's cognition. I postulated, that it is imitation that facilitates representation, where technology is also interpreted as a representation. Additionally, I argued that language, as technology-

representation, is fundamental for the formation of cognition as we know it. Therefore, if language is a technology, then other instruments could also have the potential to constitute a specific form of thinking, other than cognition as we know it. The possibility of this is demonstrated by building on Vygotsky's notion of the transition from external speech to inner speech, demonstrating how this framework can be applied universally to all forms of technology. This proposition is emphasized by integrating Bachelard's idea that external environments-materials shape cognition, I argued that all technologies can invoke specific cognitive "spaces", similar to *the space of language*, thereby expanding and transforming our cognitive architecture. I then aligned with Derrida to demonstrate how internalizing material technology, results in the erasure of its finite form, consequently creating infinite spaces that seem to originate thought, while actually being preceded by material representations. Hence these spaces *undergo erasure* and become the perceived origins of their external antecedents. This specific form of cognition then is the supplement to general cognition, and thus alters what general cognition entails. Finally, adhering to a technical mentality, which was already presupposed in imitation, by conceiving of cognition (and our instruments) as something fundamentally incomplete, we can perceive that all technology holds the potential to form cognitive spaces that extend and supplement cognition. It is this mentality, the technical mentality that I want to propose – a mentality which is crucial at this moment, and thus not inhibiting, and perhaps pleasurable – that seems to be missing in the current debates surrounding the rise of new forms of technology. As a result, cognition can be perceived as something that can be intentionally expanded.

This shift highlights the necessity to reconsider the foundational questions of learning and thinking in the context of technological mediation. Therefore, instruments, exemplified here by an isometric grid, language, cooking, tragedy serve as foundational contexts or spaces for thinking and creation. These inventions not only facilitate cognitive processes by reducing the resources required for various tasks but also generate and enable frameworks that support and extend human cognition.

By examining the interplay between technology, cognition, and the formation of thought, I hope to have provided a nuanced perspective that recognizes the critical importance of technological artifacts in shaping our cognitive landscape. This can be considered when creating and adopting novel instruments. The ability to ask the question *“how will this instrument influence how I think,”* will result in a different and beneficial approach towards the creation and implementation of our instruments. For the existence of this question itself, and the serious consideration of it, will hopefully guide HOW and WHAT instruments we want to build. Thus, we might end up, building for the evolution and expansion of cognition, and perhaps we will create alternative instruments if we start the creation process by asking that question.

Bibliography

Bachelard, Gaston. *Earth and Reveries of Will: An Essay on the Imagination of Matter.*

Translated by Kenneth Haltman. (Dallas: Dallas Institute of Humanities and Culture, 2002.)

Bachelard, Gaston. *The Poetics of Space.* Translated by Maria Jolas. (Boston: Beacon Press, 1964.)

Deleuze, Gilles. *What is Grounding.* Ed. Tony Yanick, Jason Adams & Mohammad Salemy, Grand Rapids, (MI: K& Publishing, 2015.)

Dennett, Daniel C. *Kinds of Minds: Toward an Understanding of Consciousness.* (New York: Basic Books, 1996.)

Derrida, Jacques. *Of Grammatology.* (Baltimore: Johns Hopkins University Press, 2016.)

Donald, Merlin. "Précis of Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition." *Behavioral and Brain Sciences* 16, no. 4 (1993): 737-748.

Donald, Merlin. *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition.* (Cambridge, MA: Harvard University Press, 1991.)

Garrels, Scott R. "Imitation, Mirror Neurons, and Mimetic Desire: Convergence between the Mimetic Theory of René Girard and Empirical Research on Imitation." *Contagion: Journal of Violence, Mimesis, and Culture* 12, no. 1 (2005): 47-86.

Heidegger, Martin. "Letter on Humanism." In *Basic Writings*, ed. David Farrell Krell, 189-242. (San Francisco: HarperSanFrancisco, 1993.)

Kant, Immanuel. "Extracts from Critique of Judgment." In *The Continental Aesthetics Reader*, edited by Clive Cazeaux, 2nd ed., (London: Routledge, 2011.)

Marx, Karl. *A Contribution to the Critique of Political Economy*. ed. R. Rojas. (Moscow: Progress Publishers, 1977.)

Maybee, Julie E. "Hegel's Dialectics." In *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Winter 2020 Edition. Accessed at <https://plato.stanford.edu/archives/win2020/entries/hegel-dialectics/> on 14 February 2024.

Nietzsche, Friedrich. "On Truth and Lies in a Nonmoral Sense." In *Truth: Engagements Across Philosophical Traditions*, ed. David Wood and José Medina, 14-25. (Malden, MA: Blackwell Publishing, 2005.)

Olson, David R. *Mind on Paper*. (Cambridge University Press, 2016.)

Sauvagnargues, Anne. *Artmachines*. (Edinburgh: Edinburgh University Press, 2016.)

Savin, Petre Sorin, Georgiana Rusu, Mihai Prelipcean, and Lucia Nicoleta Barbu. "Cognitive Shifts: Exploring the Impact of AI on Generation Z and Millennials." In *Proceedings of the International Conference on Business Excellence*, 18, no. 1: 223-232. 2024.

Shields, Christopher. "Aristotle." In *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta and Uri Nodelman, Winter 2023 Edition. Accessed at <https://plato.stanford.edu/archives/win2023/entries/aristotle/> on 18 April 2024.

Simondon, Gilbert. "On the Mode of Existence of Technical Objects." *Deleuze Studies* 5, no. 3 (2011): 407-424.

Simondon, Gilbert. *Being and Technology*. ed. Alex Murray, Arne De Boever, Ashley Woodward, and Jon Roffe. (Edinburgh: Edinburgh University Press, 2012.)

Simpson, Peter. "Aristotle on Poetry and Imitation." *Hermes* 116, no. 3 (1988): 279-291.

Sterelny, Kim. "Minds: Extended or Scaffolded?" *Phenomenology and the Cognitive Sciences* 9, no. 4 (2010): 465-481.

Sweller, John. "Cognitive Load Theory and Educational Technology." *Educational Technology Research and Development* 68, no. 1 (2020): 1-16.

Vygotsky, Lev S. *Thought and Language*. (Cambridge, MA: MIT Press, 2012.)

Worth, Sarah E. "Aristotle, Thought, and Mimesis: Our Responses to Fiction." *The Journal of Aesthetics and Art Criticism* 58, no. 4 (2000): 333-339.

Appendix

An example: a spellchecking tool

Moreover, another example: does using a spellchecking tool (is this also an image or a space; perhaps it is a space, here and for now *an external space*; but this external space can be replicated, imitated, into the internal space as an image; remove the distinction between internal and external spaces) in your word processor worsen or improve your spelling abilities? In line with our thinking and fear of using and adopting artificial intelligence, it might seem intuitive to answer this question affirmatively. However, the scientific evidence regarding such an intuition is not clear cut: the introduction of a spellchecker does not necessarily improve nor inhibit spell-check ability; there is evidence for both sides of the argument; this in itself is already interesting, for intuitively, we assume that a spellchecker necessarily diminishes spell-checking ability as it supposedly removes the act of “learning” spelling for oneself. This also presupposes a definitive understanding of what learning – that is, what it means to learn - entails. Yet, this presupposition rests on a constrained or *closed* interpretation of learning. In contrast, there are other possible interpretations of “learning” that might be understood in a more open-ended manner.⁷²

Yet, it is the way a spellchecker is used (and perceived) that determines whether it is beneficial to spelling ability or not: it is the instruction behind the use of this technology that is the determining factor influencing its effects. For example, studies find that learners who used spelling aids, where they perceive the corrections provided as feedback and opportunities to learn from their mistakes, gain a positive learning effect on their general spelling ability. Thus, it is not the tool/instrument that facilitates the impediment, but our relationship with the tool; better said, our posture, our *mentality* of and with the tool-in-hand, which is the deciding factor. Having a spellchecker might diminish the difference in performance between those who are not

⁷² What is the difference between the closed conception of learning and the open one?

proficient in spelling and those who are. Presumably, those with the lowest spelling ability, that is, a lack of a spatial place for the space that is language, benefit the most from having a spellchecker. (The cognitive load theory (CLT, a theory in educational psychology sciences, also states that reducing the cognitive load, thus outsourcing of cognition, is more beneficial for those who have a lower cognitive load and or lower working memory capacity). Thus, it could level the playing field in learning, simultaneously educating individuals with lesser spelling skills about the space of language and its potential by allowing them to explore and navigate through the realm of linguistic expression.

Internal spaces as instruments

These internal spaces may not initially appear as instruments, given they do not *seem* to be deliberately crafted for such purposes. However, physical instruments are not always consciously invented either; rather, they frequently emerge by chance, with the recognition of their instrumental value occurring retrospectively. Often, we discover their utility serendipitously; they exist within our milieu, subtly integrated into our existence. Upon recognizing their instrumentality, we can learn how to utilize them deliberately and effectively. This is what Bachelard suggests, through equating spaces and images, by writing that *every image, that is, every space, is an instrument, but we need to know how to utilize it.*

From particulars to universals

Derrida borrows this line of thinking from Nietzsche, who postulates that "the intellect, as a means for the preservation of the "individual", unfolds its chief power in dissimulation." Which is a loosening, a dispersion of the distinctive into a non-distinctive, a turn from identity to a non-identity, and a thing to a non-thing. This could be interpreted as a drive towards metaphors, that fundamental drive of man, which is also known as the "will to power" because this so-called will to knowledge, which we equate with the innate tendency to internalize, can be traced back to a drive to appropriate and conquer, the desire to possess and retain, thus a desire to transform what we conquer; this is internalizing; it is precisely due to our conquering that its form changes,

and in the process of its transformation, due to our appropriation, our form, the subject is changed too.

Likewise, metaphors, for Nietzsche, signify something expansive; they function like an instrument – a space or ground – through which we think. It is the result of a making equal of that which is finite, with that which is infinite and unbounded, where nothing is ever truly internalised or comprehended but designated and distorted, dissimulated. Gayatri Spivak writes, in the introduction of *Grammatology*, that "*there is no tool that does not belong to the metaphysical box.*" (this is what Heidegger suggested.) *The trace is the mark of the absence of a presence, an already absent present.*

Note on transcendental arche.

I could have used the concept of "transcendental arche" instead of space, but it unnecessarily complicates things. I find it redundant to describe space transcendentially since I do not think (like Kant) that space can be otherwise; space is always transcendental; it emerges both inward and outward simultaneously, and there is no distinction between the inward and the outward. Furthermore, I use the word "space" because while "external instruments" are (perceived as) finite, these internal instruments are not; that is, they do not have any boundaries, a definitive beginning or end, but instead function as a ground we adopt to think. I could have used the word "schema," and while this partly includes what I mean, it lacks the spaciousness of an architecture; a place, which is functional, that can be represented both internally and externally. Moreover, the external manifestation of a *schema*, or however that would take form, does not provide the physicalness, and lack of it (the openness) simultaneously, that a "space" provides; hence, I cannot speak of an external (material) variant of the schema. In contrast, for space, I can, which is a crucial part of my point that the internal and the external mirror each other in functioning. I align with Bachelard in employing this term, as his exposition of this concept in "Poetics of Space" was compelling.

Liberation

The incorporation of technological inventions is a liberation for some Beings. All technology has the potential to liberate someone or some group; the question should be, who does it liberate and who does it ignore or suppress? Liberate from what? The danger of the technology will most likely be elaborated and endorsed by those on the other side, those who oppress, those who do not benefit from the liberation. If the liberation is cognitive in nature, then those whose cognitive capacities or cognitive modes of thinking will be challenged, will necessarily caution against these inventions.