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Article

Making the Brain, Concealing the Subject: A Dialogue between Epistemological History and Decolonial theory

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Abstract:

In recent decades, knowledge about the brain has transformed radically, enabling neuroscience to venture into domains traditionally reserved for the humanities and social sciences. This expansion has prompted critiques regarding the potential implications and consequences of neuroscience's engagement with domains such as education, law, politics, and the self. Building on these concerns, this study seeks to foster a dialogue between two onto-epistemological perspectives: (1) the epistemological history of the making of scientific objects and objectivity ideals and (2) decolonial and postcolonial reflections on knowledge and its history. The former illuminates the ontology of the brain as an object conceived as ahistorical, serving as a condition of possibility for neuroscience. This configuration facilitates flourishing objectivity. The latter reveals how these elements function as power technologies, thus presenting modern science and its objects as universal, valid, and inevitable. The brain serves as a case study for a dialogue that reveals how the construction of scientific objects coincides with subject concealment. Specifically, modern subjectivity is hidden behind these objects, whereas subjects external to modernity are excluded from scientific endeavors. The genesis of objectivity unfolds alongside European imperial expansion, anchoring the modern brain's epistemic authority within the historical processes that have enabled its universalization.

Keywords: neuroscience; Lorraine Daston; decolonial; brain; scientific object

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Introduction

Recent decades have seen a radical transformation in the practices, techniques, and knowledge concerning the brain. As a discipline, Neuroscience is now among the most prominent and well-funded fields in the life sciences (Hain et al. 2023). Neuroscience, once a sub-discipline of biology, has evolved into an industry that involves billions of dollars in government and private resources. This field integrates diverse methodologies and theories

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to advance brain-focused projects, improving the care and quality of life for patients with neurological or psychiatric disorders. However, neuroscience has the potential to achieve far more than merely alleviating brain diseases. Branches such as cognitive, behavioral, and social neuroscience now offer biological explanations for human faculties, such as reasoning, interaction, emotion, habits, and culture. These efforts usually rest on two central assumptions: epistemically, cognition and behavior can be reduced to brain function, and ontologically, "we are our brains" (Vidal & Ortega, 2017). Neuroscience normativity facilitates its encroachment into domains traditionally addressed by the social and human sciences. The growing influence of neuroscientific rhetoric extends beyond the nervous system, spawning fields such *as neuromarketing, neurolaw, neuroeducation, neuroethics,* and *neurophilosophy* (Pickersgill 2013). Although the most optimistic observers speak of *neurorevolution* (Lynch 2009), more cautious ones describe it as banal and limited in scope, characterizing it as a marketing movement (Weisberg et al. 2008).

In response, some authors advocate for exploring the spaces and practices in which neuroscientific facts are produced and reproduced (Rose & Abi-Rached, 2013), along with their surfaces of emergence (Foucault 1969). The task entails assembling perspectives and concerns from diverse sources (Slaby 2010), placing the brain under scrutiny to illuminate the network of epistemic virtues and moral economies that naturalize certain forms of knowledge (Daston 1995; 2000). Our approach draws upon the historiographical framework of epistemological history (Chimisso 2024), a tradition rooted in the French intellectual lineage of Gaston Bachelard (Ferreira Almeida, 2023), Georges Canguilhem (Méthot 2013; Rheinberger 2005), and Michel Foucault, reflecting its reception and development in anglophone contexts, particularly through figures such as Ian Hacking or Lorraine Daston (Ávila and Santos Almeida, 2023). Lorraine Daston constitutes the cornerstone of our analysis, especially in her collaboration with Peter Galison on the concept of objectivity (Daston and Galison 1992; 2007). The brain fits their idea of "working objects," as opposed to real and natural ones: the relationship between the ontological configuration of these objects and its role in producing science, in being science.

We use epistemological history as an instrumental means to achieve our primary goal: contributing to wider critical neuroscience[2] using decolonial theory, particularly that of Abya Yala. Central to both approaches is an analysis of the relationship between scientific objects and the subjects who produce them, offering a foundation for this dialogue. Initially, shared concerns and perspectives are identified, with neuroscience and the brain as working examples. If Daston's leitmotif revolves around the question "What does it mean to be rational?" (Ávila and Santos Almeida, 2023), a spatial dimension is proposed: "From where does one become rational?" Instead of providing a detailed analysis of how the brain serves as a scientific object or the role of objectivity in the contemporary circuits of neuroscientific knowledge, which are both valuable inquiries, the emergence of objectivity is traced in the colonialism context, revealing its roots in a specific geopolitical framework. The ontological status of a scientific object, such as the brain, depends on its separation from the subject, positioned as if it were detached from any specific place or time. According to Canguilhem, "Science is the science of an object that is not history and does not have a history"

[2] Social studies of neuroscience have evolved and diversified alongside the emergence of the discipline. The initiative of "Critical Neuroscience" brings together several of these perspectives, aiming to analyze how and why neuroscience is becoming increasingly relevant for explaining and intervening in the human condition. This initiative was launched in (Choudhury et al. 2009), and in (Choudhury and Slaby 2011). A book with the same name was published and edited by Jan Slaby and Suparna Choudhury. In this context, the work of Joelle Abi-Rached and Nikolas Rose is noteworthy (Abi-Rached and Rose, 2010; Rose & Abi-Rached, 2013).

(Canguilhem 2005). Critical brain histories can be written from various perspectives or points of rupture, such as the configuration of the world shaped by European imperial expansion.

The Brain as a Scientific Object

The notion of what constitutes a scientific object is illuminated by its etymology, from the Latin *obiectus*, meaning "to place before" or "to oppose" (Daston 2000, 2). This opposition is essential for modern epistemic subjects, who dialectically co-modify both the ontology of the observed object and the concept's concrete determinations. Science relies on objects, as it acquires knowledge through external, exogenous, and reified factors. Within the logical empiricism framework, scientific inquiries and methods are tools for uncovering the underlying orders inherent in these objects. An epistemic position enables the observation of surrounding scientific objects using microscopes, telescopes, or logical structures. As in Maslow's law of the hammer (Maslow 1966), if modern science confines knowledge to objects, it must transform everything into an object to render it comprehensible. The dynamic construction of scientific objects can follow various pathways; Daston identifies one pathway as emergence (Daston 2000), which refers to objects created *ex nihilo*—products of pure scientific theory and technique that become the essence of reality. These objects, such as waves or particles, exemplify the process through which scientific inquiry defines and reifies entities, establishing them as objects to be discovered, examined, and ultimately controlled. Isomorphism between material, real, and scientific objects is evident, presenting the foundation for legitimizing a specific type of knowledge: one that expands its scope, penetrates new spaces and domains, and transforms phenomena into objects as it advances.

Another less radical approach is salience (Daston 2000), referring to phenomena that possesses an undeniable reality both before and after their transformation into scientific objects. Salience allows the phenomena to coalesce into the focus of scientific inquiry, facilitated by techniques and discourses that render them visible, ordered, and homeostatic. The transition from death to mortality is a regularized concept in medicine (Porter 2000), and the genesis of the "self" is an object of study in modern psychology (Goldstein 2000). Similarly, the study of the "other" in anthropology becomes feasible only by transforming it into an object (Restrepo and Escobar 2004), a process that reconfigures its chronology (Bunzl 2014) or history, as the study of the past, by constituting time as a linear and finite object (Anzalduá 2016). In biology, life becomes a scientific object through the convergence of diverse disciplines, methodologies, and organisms, unified by shared characteristics that reveal consistent patterns. This process positions life as the central organizing principle, an intangible force that brings order to the array of phenomena encompassed by the field. However, Foucault's genealogical approach challenges this notion of life as a pre-existing concept, asserting that it did not exist as a coherent idea before the 18th century (Foucault 1966). The medical framing of health and disease as modular, distinct, and manipulable constructs exemplifies this process. Proteins, genes, metabolites, and electrical signals associated with pathological processes are reconfigured into scientific objects, enabling their investigation and resolution through techno-scientific interventions (Lock and Nguyen 2018).

The emergence of scientific objects follows recurring patterns, revealing shared dynamics that merit closer examination as they undergo this ontological transformation, shifting from the quotidian to the extraordinary, a process closely tied to changes in spatial positioning. The brain or other body parts that are integral to our daily-embodied experience are relocated to microscopes, frozen at -80°C in laboratory freezers, or visualized using functional magnetic resonance scanners. Subsequently, they acquire novel epistemic values and configurations (Daston 2000). Such displacements are not merely spatial, but also historical, moving from a relative to an absolute existence (Latour 1999). Similar to how modern hospital techniques traced the Koch bacillus back to the death of Ramses II three

thousand years before, as Latour describes (Latour 1999, chap. 5), we might speculate on how developments in paleoneurobiological technique could retroactively project the brain, as a *substance*, alongside modern *neuro* terms into the past. This historical discontinuity might be a consequence or a priori of an object entering the scientific community to become scientific. The ontological *scientificization* of objects is not a binary process, but rather a continuous flow of translocations and migrations, with their scientific status contingent on specific places and actors (Daston 2000). This status is inherently transient and shaped by spatiality, as some objects inhabit the frontier between what is and what is not recognized as scientific. Between the realism that attributes intrinsic essence to scientific objects and the constructivism that defines them as historically constructed, epistemological history seeks to transcend this dichotomy by treating these objects as "epistemic things" (Rheinberger 1997). It links materiality to meanings and values shaped through the objects' examination and description (Hacking 1999).

To analyze scientific objects, Daston traces their biographies, akin to those of everyday objects, to comprehend their dynamic states as explicable, predictable, quantifiable, and manipulable. She refers to this approach as an exercise of "applied metaphysics" (Daston 2000),[3] close to Canguilhem's reflections on the objects studied in the history of science:

> Nature is not of itself cut and partitioned into scientific objects and phenomena. It is science which constitutes its object from the time when it invents a method for forming, by propositions capable of being consistently combined, a theory controlled by the concern of finding itself to be mistaken. (Canguilhem 2005, 203)

She refers to the Foucauldian concept of *episteme* as the conditions of possibility and historical circuits that enable this compartmentalization, from which specific forms of knowledge emerge as dynamic networks of discourse, materiality, and power. Foucault challenged the ethical, epistemic, and power-bound dimensions of historical ontology (Foucault 1966; 1984), and Hacking extended this analysis by asking how our ways of naming and classifying objects shaped their ontology (Hacking 2004). Vidal and Ortega (2017) adopted a similar approach by constructing a historical ontology of the cerebral subject—an anthropological figure who identifies himself as a brain. Their genealogy reveals that the cerebralization process does not result from neuroscientific knowledge but rather from its fundamental premise.[4] Hackings' *looping effect* captures the dynamic interplay between an entity and its categorization (Hacking 2004), demonstrating how the classification of objects as scientific, cultural, or political shapes their ontologies. This process ends up "making up people" (Hacking 1996); neuroscience contributes to the creation of cerebralized individuals who perceive themselves as a brain inhabiting a body, as neurochemical selves (Abi-Rached and Rose 2010). This has political implications, as cerebralization uncovers the neoliberal rhetoric of auto-government and individuality, supported by brain features such as plasticity (Pitts-Taylor 2010; 2016; Rose and Abi-Rached 2013), and the neuro-enhancement debate (O'Connor and Nagel 2017; Partridge et al. 2011). Examining the intricate processes involved in constituting the brain as a scientific object is essential to critically evaluate the claims of objectivity associated with it.

[3] For Daston (Daston 2000), applied metaphysics "assumes that reality is a matter of degree, and that phenomena that are indisputably real in the colloquial sense that they exist may become more or less intensely real, depending on how densely they are woven into scientific thought and practice."

[4] The work of Vidal and Ortega (Vidal 2009; Vidal and Ortega 2017) shifts the focus from a scientific account to examining the brain as a cultural object, as vividly illustrated in movies (Vidal 2022), or enacted in videogames (Väliaho 2014).

Objectivity and History

Objectivity is a key criterion of validity in modern science, as it suggests that knowledge can be produced without the influence of subjects, emotions, or ideology. It is a direct reference to an indisputable reality that is independent of human action (Daston and Galison 1992; 2007). Objectivity, as an epistemic discourse, began in the eighteenth century and is tied to a series of procedures, axiology, and metaphysics (Daston 1992), positing the existence of real, objective knowledge and imposing a moral obligation to pursue it through methods. The history of science commonly portrays scientific objects as immutable and absolute, and the interruption of historical continuity is deemed essential for establishing objectivity. Scientists, unable to validate their discoveries in the present, often seek precedents in the past, where, as Canguilhem observes, "an inventor invents his predecessors" (Canguilhem 2005, 200). This approach views the past as subject to the true claims of the present, with accumulative history creating the illusion that past discoveries are made within the current paradigm (Kuhn 1962). For knowledge to be deemed objective, it must be derived from a transhistorical object (Daston 2015). Despite the heterogeneity across scientific disciplines, neuroscience aligns with this framework, grounding its objectivity in the process of rendering the brain an object, as discussed in the previous section. For this analysis, a cautious distinction is proposed between the study of objectivity pursued by historians and by scientists. Following Daston's work on the historicity of objectivity, the aim is not a detailed retracing of this history, although such an endeavor within the neuroscientific context might prove valuable. Instead, the historicity is considered a premise and tool, focusing on how the epistemic authority of neuroscience and its hierarchical arrangements depend on the constitution of the brain as an object and the exploration of its broader consequences.

Facts about the brain often invoke objectivity through the juxtaposition of certain objects with their observers, whereby visualization techniques gains importance. For instance, Santiago Ramón y Cajal explicitly pursued "objective evidence" within the nervous tissue to substantiate his neuronal doctrine (Ramón y Cajal 1952), accusing his scientific opponents of allowing their theories, preconceptions, and models to contaminate their representations and drawings (Daston and Galison 2007). Twentieth-century medical histology reveals how emerging notions of objectivity necessitated dual reform. First, the observer had to be reshaped into a stoic and impartial figure, unwavering in focus, and detached from bias. Second, the act of observing transformed, prioritizing the technique of seeing. This reform emphasized a disciplined vision that sought to "let nature speak for itself" (Daston and Galison 2007). Throughout history, the creation of images has been intertwined with the evolving metaphors that have shaped the understanding of the brain. The metaphor of the brain as a circuit shaped by electrical models was visually represented in the jagged lines of cortical electroencephalographic recordings (Borck 2011). This reflects Canguilhem's insight that technique precedes theory (Canguilhem 1937), as well as how metaphors, such as the brain as a computer, serve to morally validate technology by embedding it in people. If we house a computer in our heads, how can its use be ethically questionable? (Canguilhem 2008). It is no coincidence that neuroimaging techniques occupy a leading position within neuroscience. Their compelling allure as precise representations of brain structure and function grants them the ability to "speak for themselves" (Weisberg et al. 2008), positioning them as a potent currency within the moral economy of neuroscience. These kinds of "objectivity effects" produced by neuroimages rely on their capacity to directly reference the reality of the brain (Rose and Abi-Rached 2013), while making this reality "our reality." By contrast, a non-scientific object immersed in a dynamic historical process cannot produce such images because its perpetual movement blurs them. Objects that exist *always* and *everywhere* (Latour 1999) render pointless any attempt to capture their

appearance before the moment of imaging or to predict their future appearance. Today, neuroscience seamlessly links Cajal's drawings with the literality of functional magnetic resonance imaging, overlooking the significant historical differences between the contexts in which these images were produced.

Identifying and transforming objects into scientific entities inevitably produces a spectrum in which more robustly defined objects achieve a higher degree of perceived objectivity. Knowledge linked to isomorphic, quantifiable, and comparable attributes fosters universalization and absolutization. A common idea of the brain emerges more readily when focusing on the stable molecular properties of neurons and glia or its activity measured via electrical signals. Scientific objects lacking these attributes may fail to produce a coherent image of themselves, as is the case in human or social sciences. Here, robustness and solidity seem to be tied to the ideal of minimizing variation, or, more precisely, to variation considered unexplained and frequently attributed to observer error. Canguilhem warned that scientific objectivity, aiming to eliminate errors, dismisses much of a subject's experiential value (Canguilhem 1991; Talcott 2019). Similarly, Daston and Galison described a shift from the "subjective eye" to the "objective lens" (Daston and Galison 2007). The brain, positioned as a "hard" scientific object, embodies attributes and addresses questions once reserved for other disciplines. This hypothetical epistemic Mohs scale reflects a historically constructed perspective, as neuroscience grounds in the brain explanations previously tied to "soft" objects or elusive phenomena.

Objectivity, conceived as the antithesis of subjective error and variability, justifies and privileges the aseptic isolation of components in systematic studies by eliminating the influence of the subject, who situates them in space and time. This process involves the deliberate omission of certain information, particularly information related to the subject, which modern science regards as an obstacle to objectivity. Maturana (1997) critiques objectivity as "an argument to compel" that excludes the observer, the generator of knowledge, from the observed phenomenon. Following our discussion on visualization, fixed and objective images inevitably raise questions about what lies beyond their edges and what remains outside the frame. For instance, neuroimaging quantifies brain activity within the confined space of a scanner. However, regardless of its resolution, such findings reveal little about the broader vital and historical context of both the individual being studied and the neuroscientist conducting the research. This approach promotes a monolithic science that assumes privileged epistemic access, obscuring the subject's active role, and hindering the critique of the agents and institutions involved. Subjects undeniably participate in the production of knowledge, and any attempt to isolate them merely obscures their presence, even as their effects persist. Neuroscience has had to construct an object that is sufficiently complex to eclipse observers and leave subjects outside the frame.

Beyond its epistemic implications, the brain's constitution as an object, which enables neuroscience to assert greater objectivity and expand its influence, forms part of a broader biopolitical strategy aimed at exercising power through division and demarcation (Rose 2006). This process decontextualizes life, mind, health, and disease from their practical contexts, obscuring the moral and political assumptions underlying the application of technoscience. The prophylaxis of scientific objects from the subjects obstructs their articulation and transformation during praxis. Historicizing scientific objects does not equate to invalidating them (Daston 2017). For Foucault, genealogical analysis seeks to dismantle the devices of power that underpin and are sustained by knowledge irrespective of its truth status (Foucault 1976). This necessitates a self-portrait and self-recognition of the scientific endeavor (Park and Daston 2006), not aimed at conquering its subjectivity or describing its universal traits. Instead, it involves looking into an epistemic mirror of discontinuities, not to deny or evade them but to acknowledge the historical hierarchies and events shaping this subject.

Coloniality of Knowledge and the Brain

The development of modern science during the seventeenth and eighteenth centuries, along with the genesis of its institutions, figures, and authority as producers of knowledge, unfolded in the context of imperial expansion. Critically evaluating Francis Bacon's famous quote "*scientia potestas est*" ("Knowledge is power"), presents the question about who exercises this power and against whom (Quijano 2000). In addition to organizing the world geographically, economically, and politically, imperial and colonial enterprises also produce and maintain a system of knowledge that privileges colonizers' perspectives and interests while silencing the knowledge of the colonized. Colonial knowledge structures explain and define the world based on the lived and historical experience of Europe. This is known as the coloniality of knowledge (Lander 2000). Considering how modern science has been shaped compels us to rethink modernity through narratives beyond its own, challenging the history of science that portrays it as exclusively Western and inherently virtuous, a self-portrait of Europe (Daston 2006). Western science was neither inherently superior nor more trustworthy than other knowledge systems; it simply gained prominence through the advantages conferred by European expansionism (Harding 1992). This expansion is often framed as a product of its logical and technical superiority, a narrative reinforced by George Basalla and Joseph Needham historiographies (Basalla 1967; Needham et al. 1999),[5] in which Western science developed *ex nihilo* for the former and from a divergence for the latter (Raj 2013). According to historian of science Raj (2013), "science does not circulate because it is universal but rather becomes universal because it circulates."

Beneath the initial aesthetic satisfaction and media hype surrounding the brain lies a technoscientific conglomerate (Insel et al. 2013; Quaglio et al. 2021), involving biotechnological, pharmaceutical, and military industries (Healy 2002; 2006; Moreno 2006). The global industry is valued at $145 trillion, with 80% of the production concentrated in ten countries in the Global North (Hain et al. 2023), thriving on both the current sale of psychopharmaceuticals and the promise of novel therapeutic solutions. However, Eroom's law points to an inefficient, slow, and expensive process of drug development (Scannell et al. 2012). This reality has led to neuroscience being termed the "graveyard for drug development" (Stovall 2011), as new ideas are scarce (Miller 2010), and pre-commercial planning and marketing precede medical needs (Applbaum 2009a; 2009b). Here, the compelling allure of neuroscience "loses its romanticism" (Stadler 2011). The portrayal of modern technoscience as an industrial complex operating through capitalist interests driven by market dynamics and the pursuit of value, is not exclusive to neuroscience (Andrews et al. 2006; Greenberg 2007). However, the historiography of science seldom situates the rise and diffusion of early Western science within the context of both economic and civilizational agendas. Although science is currently deeply embedded with neoliberal and corporate values, manifested in practices such as valuation through individual metrics (Burrows 2012) or the privatization of knowledge through paywalls and selective open-access models (Suber 2012), the narrative of historical science remains detached from these critiques. Instead, it is portrayed as the product of a handful of white European (male) geniuses who supposedly

[5] A figure associated with epistemological history, like Alexandre Koyré laid the foundation for a history of European science, introducing the term "scientific revolution" and situating it within a specific geographic and historical context—namely, around 1600 in Central Europe (Somsen 2008). This framing notably excludes the so-called Middle Ages and, with it, the contributions of Islamic and Chinese science, among others.

overcame religion, personal biases, and subjective influences to establish and diffuse modern science. In this sanitized account, imperial, economic, and moral entanglements are conspicuously absent, as though these figures and their works were untouched by forces shaping their world. Roy MacLeod critically challenged the notion of a neutral and ahistorical diffusion of science by the West, arguing that this image, when critically examined, would reveal: "[…] like the picture of Dorian Gray, the ugly decaying features of the 'imperialist'" (MacLeod, 1982).

Enrique Dussel highlights a foundational myth of modernity that obscures violence and invasion preceding its enlightened and emancipatory ideals for almost two centuries (Dussel 1994). Without the looting and pillaging that began in 1492 with Columbus's arrival on the island of Hispaniola, rational modern enunciations of European science from the seventeenth century would not have been possible. The Cartesian *ego cogito* of "I think, therefore I am' is preceded by the imperial *ego conquiro* of "I conquer, therefore I am" (Dussel 1994, 40). In 1637, Descartes wrote his philosophy in Amsterdam, a decade after the founding of the Dutch West India Company, at a time when the Netherlands, alongside other Central European powers, emerged as the center of a new world system dominated by the Atlantic slave trade. The dualist and solipsistic myth of a self-generated subject without spatiotemporal localization inaugurates a key epistemological myth of modernity: access to universal and objective truth. Canguilhem highlights an ambiguity in the Cartesian principle, questioning who or what constitutes the "I," and asking, "if the brain perceives actions, whose actions are they?" (Canguilhem 2008). This ambiguity enables the cogito to function independently of a defined subject (Canguilhem and Porter 2005). Shapin (1998) expresses it succinctly: "Truth is - and, arguably, always has been - the 'view from nowhere'". Merleau-Ponty's exploration of the relationship between observers and observed (Merleau-Ponty 2013), and Donna Haraway's concept of situated knowledge (Haraway 1988), are other key contributions that problematize the questions of space and location in science. Problematizations closer to postcolonial analyses can be found in Raj's work (Raj 2007; 2013). Raj emphasizes that despite the widespread notion of knowledge as circulating and dynamic, the positivist model dominating the history of science seldom interrogates the question of *where* knowledge is situated (Raj 2013). Sociologist Ramón Grosfoguel argues that the Cartesian *ego*, ultimately detached from any particularity and transcending space and time, claims to attain knowledge from "God's eye" (Grosfoguel 2013).

These are the political, economic, cultural, and social conditions required for a subject to assume a sort of epistemic and moral "zero point." An arrogance that Castro-Gómez terms as the *hybris* of the zero point (Castro-Gómez 2021). This raises several critical questions. What conceptions of the brain emerge from this zero point? What are its ethical and political implications? Fully addressing these questions exceeds the scope of this work; however, insights can be gleaned from examples that illustrate how neuroscience is produced from this zero point. A particularly revealing example lies in the contemporary classifications of "culture-bound syndromes" in the DSM ("Culture-specific disorders" in the ICD), which frame certain conditions as uniquely tied to specific cultures, prompting critical questions: To which culture are the remaining psychiatric categories bound? (Kirmayer et al. 2017). Here, the historical brain assumes center stage as a scientific object. It is positioned as the material entity responsible for disorders and anomalies, and its treatment depends on its study and manipulation. The idea of the brain, once it extends beyond the confines of the laboratory or the resonance machine, becomes intertwined with the mechanisms of governmentality characteristic of colonial and liberal societies (Rose 1999). Ultimately, this produces a platonic scientist who observes and thinks from the zero point. Objectivity demands reformed observers, who must adopt a normative and stoic imperative to regard phenomena impartially, effectively excluding themselves from the equation. The brain appears to

succeed in this separation operation, contrary to what Canguilhem observed in medicine where patients are simultaneously objects of science and subjects (Canguilhem 1991).

The direct reference to reality conveyed by images of the brain strips it from historicity and any trace of subjectivity or emotion, constructing both an ontological object and epistemic site. The brain becomes the zero point, the nowhere from which thought originates. Daston and Galison observe how scientific objects "still aim to 'map' the territory of the sciences they serve" (Daston and Galison 2007). The emphasis on visualization and images in Daston's work invites an analogy to the spatial configuration of territories in colonial geography. In cultures outside modernity, land, territory, and Earth are often conceptualized as subjects. Examples include *Pachamama* in Quechua, *Ñuke Mapu* in Mapuche, and *Bhumi* in Hindu culture. Similarly, the Greek *Gaia* reflects an understanding of the Earth as a sentient being, usually as a nurturing mother. In stark contrast, modern science requires the transformation of land into an object to understand and categorize it. The development of cartographic and mapping techniques is pivotal in elevating geography to a modern scientific discipline. Yanomami shaman Davi Kopenawa highlights how "white settlers draw the land in order to divide it" (Kopenawa and Albert 2013), exposing how the apparently neutral task of geography serves the political and ethical interests of the colonizer. This compels the question regarding the underlying interests and assumptions that shape neuroscience as it seeks to map human nature, emotions, and knowledge onto the brain. Who benefits the most from *neuro-revolution*, and from where? Addressing this question requires a much broader scope than the text allows. Canguilhem's observation that scientific objects follow the application of techniques (Canguilhem 1937), raises a critical issue regarding the control of these techniques, which are materially tied to specific spaces such as laboratories, hospitals, and corporations. Starting with Frantz Fanon's analysis of psychopathology, in which psychiatric categories are traced back to colonial experiences (Fanon 2002; 2014), and extended to constructs such as drapetomania (Medlock et al. 2016), we can observe how psychiatric categories were shaped by colonial power technologies. The use of IQ testing as a technology for ordering and classifying individuals in racially biased terms, as employed by figures such as Hans Eysenck and Richard Lynn in the twentieth century (Colman 2016; Thomas 2011), but also with more recent accounts (Ceci and Williams 2009), exemplifies the entanglements between objects, images, categories, and values resulting from technoscience.

Alongside the ontological and epistemic configurations of scientific objects and the subjects producing them from an imagined nowhere, it is equally important to undertake a historical reflection on both. Despite their varied approaches, a unifying concern among scholars in the field of epistemological history is the imperative to historicize scientific categories, thereby resisting the tendency to treat contemporary scientific ideas and objects as timeless or self-evident truths (Canguilhem 2005; Chimisso 2024). For instance, Kant's critique of pure reason was grounded in the science of his era, offering a critique that reflected a specific historical moment (Chimisso 2024), shaped by the perspectives of a narrow group of men from a few European countries (Grosfoguel 2023). Kant regarded the categories of scientific thought as definitive and absolute, thus rendering them ahistorical. By examining epistemic artifacts, such as objectivity, Daston transcends the history of ideas to address the Kantian question of preconditions for science, situating contemporary science as an episode in the broader history of human knowledge (Daston 2006), decentering the Basalla and Needham conception of the history of Western science. The transformation of everything surrounding modern subjects into objects devoid of history is the foundational condition for producing objective scientific knowledge. Canguilhem observed that "the inventor invented their predecessor," constructing a monumental and carefully curated past for the discipline. Similarly, Grosfoguel critiques how the historical periodization of "global" or "universal" history reflects a distinctly European perspective (Grosfoguel 2023). The

portrayal of the Middle Ages as a dark and stagnant millennium between the grandeur of ancient Rome and the so-called "discovery" of the Americas reinforces a Eurocentric narrative. Grosfoguel offers an alternative perspective, proposing that it should be recognized as "the flourishing of Islamic science and philosophy" (Grosfoguel 2023). Europe, as a concept, appears to traverse an immutable historical continuum, mirroring the perceived permanence of scientific categories and objects. Daston's and Galison's analysis of objectivity as the subject's antonym may offer a compelling dialogue with decolonial scholarship on the genesis of Eurocentric subjects. The brain reflects objectivity, framed as "a counterpoint to certain aspects of the self," by becoming an object through images and artifacts.

The periodization of Universal History reduces the past to fixed and immutable objects, simultaneously granting a scientific and valid history to certain subjects, while denying it to others. The teleological narrative of Western domination as both definitive and inevitable relies on this selective and incomplete historicization, which not only constructs a thaumaturgical ahistorical zero point but also constructs non-existences and blind spots that perpetuate inequalities and injustices. Phenomena misaligned with the normal science paradigm are rendered invisible (Kuhn 1962). The geopolitical location of the conqueror is built upon the ruins of four *genocides-epistemicides* (Grosfoguel 2013), against the Muslim and Jewish populations in Al-Andalus, against the women accused of witchcraft in Europe (Federici 2021), against the Indigenous peoples of the Americas, against the diaspora of enslaved Africans, and against the "mad" confined in general hospitals (Foucault 1961). Modern science focuses on making objects visible while concealing the observer by overlooking the blind spots it creates. Its inability to fully encompass world phenomena becomes clear when viewed from the perspective of colonized individuals who are excluded from defining science. Subjects' histories appear fragmented and external to modernity's narrative (Harding 1992). These are the "wretched of the Earth" (Fanon et al. 1961), the "subaltern" (Spivak 1994), subjects relegated to the past through the denial of their history, excluded from the zero point, and unaligned with the Cartesian *ego cogito*. Decolonizing this stance requires a radical exercise of contextualism that situates and provincializes Europe within the geopolitics of knowledge (Dussel 1977), revealing who produces modern knowledge, from which locations, and re-embodying knowledge that is historically rendered disembodied.[6]

Neuroscience's ambition to map every human experience to the brain, culminating in the creation of cerebralized subjects, exemplifies a dynamic that generates significant asymmetry. Universal knowledge, presented as objective and grounded in neural phenomena, is granted the authority of exactness and precision, whereas the understanding of individual and collective behavior relies on fragmented and diverse concepts, such as society, humanity, or spirituality, which are traditionally explored by the social and human sciences. Epistemically, the neuroscientific conglomerate exhibits a colonial-like dominance over other fields, as evidenced by its disproportionate funding and media visibility in modern science (Hain et al. 2023; Schleim 2014). Here, the term colonial is used with caution, fully aware of the risks associated with its decontextualized application. It is neither homogeneous nor universally applicable in the same way across all regions and processes. To analyze its impact on the production of knowledge about the brain, it is essential to consider the specificities of each neuroscientific question, subdiscipline, context, and application. The aim is to highlight the shared patterns emerging from the interaction between scientific objects, their producers, and their intertwined histories, with

[6] As an example, Juan José Bautista, in his book "*¿Qué significa pensar desde América Latina?*" (Bautista Segales 2014), responds to Heidegger's eponymous work by embedding his philosophy in a subjectivity shaped by Andean culture and spirituality.

neuroscience functioning as a *mise en abyme* in modern colonial science. This is just one example of the potential outcomes that can emerge from the dialogue to be established.

The diversity of epistemological history offers fertile grounds for engaging with other critical approaches (Vagelli 2024), including decolonial theory. Current *neuro-revolution*, such as the emergence of objectivity described by Daston and Galison (2007), is not inevitable but rather a response to specific demands in particular contexts. Analyzing them necessitates an encounter between History of Science (Daston, 2015) and Global History, while decolonial theory can help us to critically interrogate the very notion of the "Global." In this sense, epistemological history categories rooted in modern science may benefit from a decolonial critique. Key figures such as Brunschvicg, Metzger, and Bachelard, who shaped this historiographical approach, were influenced by Lévy-Bruhl. His notion of "scientific mentality" (Levy-Bruhl 2018), later echoed in Fleck's "thought styles" (Fleck 1979), originated from anthropological comparisons that dichotomized rational and primitive mentalities, often framing non-Western as inferior (Chimisso 2024). Bachelard built on this idea, proposing that all societies have a "primitive" past, but only Western nations have transcended it, treating this as an obstacle to true knowledge. This cultural racism parallels Basalla and Needham's historiography of science as well as the rhetoric of overcoming obstacles often attributed to both scientific subjects and objects. This list can be amplified by many examples in which the characteristics of epistemological history can be transformed from a decolonial lens. This applies to critical neuroscience broadly, highlighting that the objects of critique and history are "prefabricated" (Santos Almeida, 2024). This is a limitation of the internal critique, which frequently fails to recognize that disciplines subordinated by neuroscience also constitute colonial knowledge systems. As Immanuel Wallerstein observed, social sciences emerged in the late nineteenth century in universities from five European countries (Wallerstein 1996), shaped by political imperatives of control and epistemic demarcation dynamics that persist today. A critique of neuroscience originating from these disciplines may be insufficient, as it often results in a reform that simply incorporates diverse voices to sustain itself as a discipline. What is required is not a multidisciplinary critique, but a transdisciplinary one (Grosfoguel 2007). This approach entails moving away from the centrality of universal narratives to critique from the periphery – a point where objects do not obscure critical analysis. Following the challenge posed by Slaby and Choudhury (Choudhury et al. 2009), their proposal underscores the significance of embracing the heterogeneity of languages and methods when formulating a critique of neuroscience. Far from a universalizing pretension that confines this critique to specific fetishes, theories, or disciplines, the idea is to open up to various places, actors and histories to explore where knowledge about the brain is negotiated and stabilized. The political transformation of the history of science involves valuing the historicity of epistemic practices from historically marginalized groups grounded in their realities.

All humans have a brain, which, whether suffering from a disorder or not, is susceptible to some form of intervention or enhancement framed by neuroscience (Partridge et al. 2011; Schleim and Quednow 2018). Today, it is difficult for modern subjects to not perceive their identities and existence as mediated, in part, by their brain (Vidal 2009; Vidal and Ortega 2017). These identities perpetuate colonial dynamics that dictate what is and what is not. All our knowledge is reduced to objective knowledge and our mind is reduced to the brain in the same way that history, experiences, and colonial realities are subsumed under the history, experiences, and realities of the metropolis. Therefore, if colonialism constitutes the "history of the present of us all" (Grosfoguel 2007), so does the constitution of scientific objects and objectivity. This reflection is not without its limitations. The analysis has privileged a theoretical and historical reading of neuroscience, which cannot account for the heterogeneous and situated ways in which neuroscientific practices are enacted, contested, and re-signified in diverse contexts. A constitution occurring in broad and diverse contexts

evolves at the pace of capitalism, rendering any attempt at a monolithic analysis encompassing the entire discipline futile. The intention is not to encompass all neuroscience under a single diagnosis. Such an approach would risk turning the ethical and political dimensions surrounding the neuroscientific episteme into an object, "opposed to us," subjects. Neither is a direct questioning of all knowledge obtained under these premises pursued nor is there an interest in auditing its validity or consistency. Instead, the focus is on examining its ethical-political consequences, which arise from positioning the brain as the locus of the epistemic and moral. Future work should engage more directly with these empirical and plural articulations, exploring how neuroscientific knowledge is appropriated within different socio-political formations and forms of resistance. The central nervous system must be relocated and situated in a concrete and recognizable place. Neutralizing the political technologies of intervention and administration that rely on knowledge about the brain requires the pluralization of the idea of the brain. In contrast to the epistemic totalization of the objective, we can situate the neuro in a context, in a historical a priori, so that it is valid, not as an object, but through its practical articulation by the subjects involved in different emancipatory struggles.

Conclusion

In this study, we showed that neuroscience's growing authority across technology, health, education, law, and the self is grounded in the historical constitution of the brain as a scientific object. For this purpose, we brought into dialogue two onto-epistemological perspectives: (1) the epistemological history of the making of scientific objects and objectivity ideals and (2) decolonial and postcolonial reflections on knowledge and its history. Through the first, we showed how the brain is produced as an ahistorical, self-evident object that sustains neuroscientific objectivity. Through the second, we highlighted how this objectivity functions as a technology of power, presenting modern science and its objects as universal, necessary, and inevitable, ultimately legitimizing its expansion. The brain becomes a revealing case for observing how the making of scientific objects entails the concealment of the subjects who produce them. Situating these dynamics within the framework of coloniality shows that the production of scientific objects—and the modern ideal of objectivity—rests on spatial, political, and economic asymmetries inherited from imperial expansion. A decolonial perspective therefore allows us to question the supposed neutrality of neuroscientific categories and to understand the cerebral subject as a product of historically situated practices rather than a universal truth. Recognizing these entanglements demonstrates that neither the brain nor objectivity can be separated from the histories that shape them. Attending to these histories not only clarifies how neuroscience gains and exercises authority but also opens conceptual and political space to pluralize what the brain can be, for whom, and under what conditions. This approach does not reject neuroscientific insight; it repositions it within the subjects, histories, and power relations that make such knowledge possible.

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