SECTION 4

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ART, AESTHETIC EXPERIENCE, AND THE PERFORMANCE OF SELFHOOD

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WHY BRAIN IMAGES ARE NOT REPRESENTATIONS OF THE SELF: THE TRANSPARENCY OF THE BRAIN/BODY/MACHINE SYSTEM[1]

abstract

Brain imagery is central to the representation of personal identity at the expenses of the living body. This essay explores how visual and performance art, cognitive science, and neuroscience have contributed to the dissemination of the idea that to "be" means to "have a brain". Brain scans as forms of "inner portraits" have naturalized a reductive vision of personhood, overshadowing the entanglement of the body with the environment and technological apparatuses. The supposed transparency of brain images is questioned through artworks by Abdoulaye Konaté, Jan Fabre, Pierre Huyghe, and Refik Anadol among others, and discussed via the concept of visibilization: a medial process that renders visible what is not visual. MRI and fMRI are shown to be a acoustic operation involving the brain, the body, imagers, and the environment in a relational system. The article calls for a rethinking of human subjectivity as part of material, epistemic, and narrative networks.

keywords

brain images, brainhood, media transparency, personal identity, entanglement, visibilization

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1. Public Brains, Neglected Bodies and Invisible Arguments

For over fifty years, visual and performance art have depicted "the brain" as a metonym for "personal identity," displaying it in a wide range of media and settings. The introduction of the cerebral organ into the domain of the visible as a general portrait of human beings induces a neglect of their phenomenological bodies. As Paul Ricoeur sharply observed (1990), "the cerebral fictions used to discuss personal identity neutralize the body and restrict it to the brain, at the expense of the self as flesh" (p. 378). This narrative originated in the West. In fact, "no other culture has proposed the reducibility of Self to an organ of the body" (Vidal, 2009, p. 11) and built a whole rhetoric around it. That notwithstanding, the embrained notion of the Self has by now been registered in countries and contexts all over the world. Thus exported, the visual telling of a global cerebral narrative continues to unfold, all too often without further explanation of how brains, bodies, and personhood are related, and what part images play, together with the devices needed to produce them. All in all, brain scans are highly effective vehicles for defining a new, globally accepted concept of personal identity.

Just consider the work *Open Mind* by Cuban artist Yoan Capote, featured at the 10th Havana Biennial (2009). A brain-shaped labyrinth with walls made of painted PVC and metal replicating the cerebral hemispheres and neural folds invited visitors to walk through as if they were neurons traversing thought processes. The installation was site specific and set in dialogue with the Morro Castle, suggesting a relation between historical memory and personal consciousness. Extracted from the skull, the brain had materialized as a standalone object. The Malian artist Abdoulaye Konaté, a leading figure in African contemporary art, in 2016 created one of his large-scale, colorful textile works, titled *Non au fanatisme religieux*. It bears a transcultural message of secularism, rendered in French yet oriented from right to left, following the direction of the Arabic script. Embroidered in white at its center is a brain. It serves as a symbol of rational thought, based on an idea of the Self as discrete and independent of beliefs and opinions pertaining to the sensible world.

This epistemic account, which characterizes Western modernity, has flourished since its inception. Gilbert Ryle (1949) has shrewdly observed that the ideology of the Self as a "pure" cognitive agent stems from Descartes (and more notably, his readership), who conceived of human beings as articulated in an "inside" where cognition happens privately and in the same way for everybody and an "outside" where social relations happen thanks to specific bodily behaviors occurring in cultural environments. This divide between the secret mind and the public body has survived for centuries, notwithstanding critiques leveled at it by

philosophers—notably contemporary ones (Deleuze, 2024; Braidotti, 2002)—as well as by some neuroscientists (Damasio, 1994; Gallese & Morelli, 2024). However, the knowledge that cognition depends on neurobiological mechanisms complicates the split, and even contradicts it, because in vivo individual brain activity enters the public eye and does so through scans. We can finally see our minds pictured, can't we?

The general understanding is that brain images, once outside the medical context, can be looked at the same way as portraits are (whether painted, photographic, video, or otherwise generated). The onlooker's behavior is analogous in both cases, for the greater glory of the brain that I am as a person. A striking overlapping is at stake between the individual, the cerebral matter, the image, and the medial and conceptual tools (the technology and the knowledge) required to produce my brain scan. For, brain imaging aligns with "a philosophically informed methodological individualism, in the sense that for many theorists the goal is to identify mechanisms found within an individual, and specifically within an individual brain, to explain how that individual understands other people" (Gallagher, 2020, p. 3). Along the same lines, Fernando Vidal (2009) argues that

> the individualism characteristic of western and westernized societies, the supreme value given to the individual as autonomous agent of choice and initiative, and the corresponding emphasis on interiority at the expense of social bonds and contexts, are sustained by the brainhood ideology and reproduced by neurocultural discourses. (Ehrenberg, 2008, p. 7)

Over the past fifty years, a notion of human beings that is deeply shaped by medial practices grounded in brain activity has emerged.

> To have the same brain is to be the same person, and [...] the brain is the only part of the body we need in order to be ourselves. As a 'cerebral subject,' the human being is specified by the property of 'brainhood,' i.e. the property or quality of being, rather than simply having, a brain. (Vidal, 2009, p. 6. See also Ferret, 1993, p. 79)

An interesting instance of the alliance between our old trust in portraits, our new reliance on cerebral scans to grasp the inner Self, and the cerebral subject emerges from a conversation between Bruno Latour and Paul Churchland. The former, a leading figure in science and technology studies, reports the exchange he had with the latter, a prominent neurophilosopher, according to which common sense psychology provides radically false theories on human cognition and should be completely replaced by neuroscience (Churchland, 1984). Despite his theoretical normativity, Churchland was carrying in his wallet a color scan of his wife's brain, just as one might carry the photograph of a loved one taken in a photo booth. According to Latour (2004),

> Paul insist[ed] adamantly that in a few years we will all be recognizing the inner shapes of the brain structure with a more loving gaze than noses, skins and eyes! Unquestionably, Paul sides with the eliminativists: once we have a way of grasping the primary qualities (in his case the brain macrostructure, but it could be, for other even more advanced scientists, the microstructures of individual neurons, or the DNA sequences of the brain itself, or even further, the atomic structure of the biophysics of the DNA [...]), we can eliminate as irrelevant all the other versions of what it is to be a body, that is, to be somebody. (Latour, 2004, p. 224)

That Churchland's wife, Patricia, may not have objected to her large blue eyes, blond hair, and white skin being replaced by a cerebral scan conventionally colored is irrelevant to the matter at hand. Her belief that "I am who I am because my brain is what it is" (Churchland, 2013, p. 11) only underscores the extent to which the medial character of the cerebral data that machines extract, collect, and make available to a large audience through images is disregarded in ways that neglect the lived and living body: in this instance, hers.

Even more, the embodied nature of the brain and the embedded nature of the brain/body system are bracketed. In the case of brain images serving as representations of oneself, the bracketing occurs because they are conceived of as transparent means of accessing the brain as the primum mobile of personal identity. It's right there for us to see, as if we had just opened a window in the skull. The "inside" has then been externalized, pace Descartes, and our brains have become "sites where organs and eyes meet", to paraphrase Michel Foucault (1963. See also van Dijck, 2005). Such a "meeting" is possible thanks to the idea that imaging techniques do not affect our "looking at", as if they were imperceptible.

An interface that "erases itself, so that the user is no longer aware of confronting a medium, but instead stands in an immediate relationship to the content of that medium" is called "transparent" (Bolter & Grusin, 1999, p. 24). That "leads one either to erase or to render automatic the act of representation" (ivi, p. 33), that is immaterial and impersonal. This is what happens to brain imaging when scans leave the medical room and enter the layperson world. The "scanned" brain—whether printed or on-screen—suggests, on the one hand, a denial of the machinery at work and, on the other, an obliteration of the human body under the scan, as if beds, computers, screens, cables, radiologists did not enter in the image making process, and a specific human being with all his/her physical idiosyncrasies was not laying there. Such a neglect of the personal body in its situatedness and material entanglement goes hand in hand with medial transparency and leaves us in a blind spot.

But for transparency to occur, not only must the material and medial conditions of images themselves be neglected; the knowledge system that configures our understanding of ourselves and others—and dictates how we act in accordance with it, in a loop of retroaction and mutual shaping—must also be overlooked, since no medium develops in isolation from the theoretical positions under which it is experienced, acknowledged and interpreted; each medium works also as a network of technical, political, and economic forces, which are an integral part of specific ways of thinking. The invisibilization of the brain imaging techniques is then theoretical, medial, and material and affects scholarly accounts. The obliteration of medial and intellectual entanglement induces an epistemic blindness with respect to the way in which we explain ourselves. It deeply affects us as epistemic agents, so much so that even a rigorous eliminativist scholar believes in the power of some kind of images to make the beloved present.

The self-erasure of media ally with the self-erasure of the genealogy and the implication of theoretical arguments that stem from the common sense that they nourish in turn (Wittgenstein, 1972; 1989). Notably, the actual material condition under which the intellectual activity is carried out is overlooked, as if we were purely abstract thinkers (Ahmed, 2006). Feminist philosophy has been effective in unveiling the extent to which the supposed clarity of theoretical propositions and their subsequent efficacy depends from the disregarding of their own situatedness, despite the intertwining of first- and third-person perspectives and the tools and devices used to direct our understanding. The competition among conceptual accounts arising from such a disciplinary narrowing leads to specialized claims and a fragmented and scattered understanding of the Self.

To mitigate the paradox of a quest to know who we are that ultimately obscures how we live and think, many philosophers in recent decades have argued for a multidisciplinary

approach that addresses personhood in its full complexity. Shaun Gallagher (2013) proposes a "Pattern Theory of Self" to advocate for a multilevel perspective to understanding human nature. He posits that "to stay plural about the concept of the self," (1) we should not consider physical, social, private aspects as mere modifiers of an independently existing Self, and invites us to think of them "as organized in certain patterns, [...] a particular variation of [which] constitutes what we call a Self" (1). According to him, the Self results from various contributory elements, "none of which on their own is necessary or essential to any particular self. This is not a pattern theory of 'the Self.' Rather, what we call 'self' is a cluster concept that includes a sufficient number of characteristic features" (3). He identifies several groups of aspects encompassing neurobiological, affective, behavioral, interpersonal, cultural, material, and narrative dimensions. Gallagher's proposal has the advantage of transcending any nature/culture or mind/body dualism and accommodating different types of experiences, knowledge, and media. More important, it conceptualizes the Self as an agent capable of acting and being acted upon, rather than a detached and encapsulated observer of the surrounding world. However, the dynamics of cooperation or conflict at work in the (cognitive and corporeal) Self remain to be fully acknowledged and described.

As often happens in the cognitive sciences, the discourse blurs when addressing the actual conditions that shape the formation, expression, and recognition of the Self in the mundane world and how they sensibly intra-act (Barad, 2007) with our bodies to different degrees and in different ways. Cognitive neuroscientific understanding, based on brain visualization, requires then a more fitting acknowledgment of how such techniques feed back into the brain/body system. Interestingly enough, when such an enterprise is undertaken, transparency is not questioned. For instance, Gallagher's critique, whereby "in an fMRI experiment [...] the experimental subject is necessarily alone in a large noisy machine, where bodily movement is extremely limited" and that impedes his/her study, since "our primary form of social cognition depends at all on bodily, in-person interactions with other people, rather than passive observations [...] (see Schilbach et al., 2013; Gallagher et al., 2013)" (2020, p. 3), does not challenge the image making process.

In the end, the powerful visual narrative in which brain images have trapped us affects the whole epistemic enterprise whereby we understand our identities, and ultimately shoddily equates humans with internal organs. I will try to pick apart this narrative by articulating the entanglement of living matter and machines, of brains and bodies, of human beings and the environment they inhabit and die in, showing the interplay between narrative props, our living cerebral organ, and its images.

2. Embedded Machines

Self-narration has always produced an extraordinary quantity of personal images (Giannachi, 2023). The history of portraiture—from the legendary figure of Butade's daughter to the Montmartre painters—and self-portraiture—from Albrecht Dürer to Bruce Nauman and present-day selfies—offers substantial evidence of this phenomenon, which occurs in different techniques, styles, and time periods, yet consistently privileges the surface of the frontal part of the head. Portraiture as a visual technology of the Self reinforces the idea that personhood is discrete and localized within a framed space, and relegates its surroundings to the backgrounds. This is rooted in a physical condition, which is the insularity of the face with respect to the rest of human anatomy (Simmel, 1901; Deleuze & Guattari, 1980). The face is "beheaded," cut out from the rest of the body, at the cost of freezing our living personhood (Cappelletto, 2025).

The downplaying of the body in favor of one of its most prominent part is redoubled by brain images, which have permeated popular culture since the eighties, even before the neuroscientific hype of the nineties, which then-President George Bush referred to as the

decade of the brain. The July 1983 issue of Vogue featured an article titled "New Seeing-Eye Machines," presenting three vividly colored PET (Positron Emission Tomography) scans accompanied by a caption for a lay audience: "These brain scans show—graphically—how a normal brain's function compares to that of a depressed or schizophrenic patient" (Hixson, 1983). As the anthropologist Joseph Dumit (2003) has remarked: "These images persuade viewers to equate person with brain, brain with scan, and scan with [medical] diagnosis" (p. 36), which offers a particular type of narrative. Notably, machines are equated with eyes. In so doing, their medial and material character is erased, despite the costs, energy, scientific knowledge, and technical know-how associated with operating them.

Twenty years after that first publication, in 2003, the conceptual artist Jonathon Keats underwent functional magnetic resonance imaging (fMRI) while contemplating themes like art, beauty, love, and death. The resulting images were exhibited at the San Francisco Modernism Gallery, where they served a novel purpose: to sell his brain activity, which he identified as an artwork generated by his cerebral processes, in a unbroken continuum. No methodological perplexity was raised by the idea that Keats's brain could be treated as independent of Keats the person, or that Keats's blue, red, white, and black scans were not immediately linked with his brain activity. Moreover, while the 1983 Vogue article tried to verbally describe as accurately as possible the scans' production and the role played by imagers and radiologists, subsequent uses of brain imagery in nonscientific or nonmedical contexts have largely dispensed with explanations.

Mesmerized by its graphics, we witness the old story of the inner Self now mechanically transduced into the public eye to be seen, grasped, and understood. As Jean Baudrillard (1986) anticipated, "all that fascinates us is the spectacle of the brain and its workings," and "what we are wanting here is to see our thoughts unfolding before us" as if they were born out of Zeus's head. A strong bond has developed "between image making and the scientific enterprise aimed at determining neural processes of subjectification: [...] It would seem that neuroscience has saturated the explanatory field of the Self, aided by depictions of cortices, thalami, and the like" (Cappelletto, 2022a, p. 1). In 2007 brain imaging had evolved to the point that the American Psychological Association (2007) saw fit to celebrate fMRI as a technique that "produces movies starring the brain", as if there were no mediation at stake.

The first artist to use MRI was Justine Cooper in 1998 with her video animation *RAPT I*, which attracted broad public attention. Since then, two main types of visual evidence testify to the spectacular interest in neurological mechanisms devoid of proper phenomenological appearance, which serves as raw material for artists to work with.

In the first type, the visual outputs are replicated with materials from craft and artistic traditions that long predate brain imagers. In 2011 Dario Ghibaudo wove prayer rugs dedicated to the seven deadly sins, each localized in a different, color-coded area of the brain. The idea is that neurology suggests that sins are part of human mental activity, irrespective of one's faith. Mixed techniques are also employed in the ambitious multimedia project led by Jan Fabre, which combines performance, video, photography, and drawing. In *Do We Feel with Our Brain and Think with Our Heart?* (2013), the Belgian artist recorded videos documenting his dialogue with Giacomo Rizzolatti, the neuroscientist from Parma whose research team discovered mirror neurons in the nineties. Both the artist and the neuroscientist wore EEG electrodes, as they would in the experimental setting, which was conceptually replicated. In 2017 Michela Martello, working at the threshold of fiber arts and the clinic, embroidered a sagittal cut of the brain in pink on an old piece of beige linen for her piece *Grandmas Mirror*. In 2018 Laura Jacobson created *Resonance Punctuated CXLIV* in painted ceramic and wood, producing a form that clearly recalls a horizontal scan, although the object looks like a handmade craft assembled from scrap materials. Brain images are also integrated in multimedia artworks. In

2025 Laia Abril hung brain images in her installation *On Mass Hysteria* to visualize emotions experienced by girls and women facing political or personal oppression, such as anger, sadness, or fear, which lead to fainting, tremors, and even laughter and trances.

In the second type of brain artwork, artists use the same kind of imagers as those employed in research or clinical settings. I will present three meaningful examples. The first is by Pierre Huyghe. The French artist has long explored the human/non-human relationship, more recently redefined as the living/non-living relation. In his *UUmwelt* series (2012) Huyghe asked participants to enter a fMRI scanner, where they "were given verbal descriptions or shown pictures of living creatures, prehistoric tools, machines, codes, and artworks; the data were then processed via an AI neural network [...] which learn[ed] and progressively reconstruct[ed] the images by matching them with pictures taken in the real world" (Cappelletto, 2022b, p. 93). *UUmwelt* was produced at the laboratory led by neuroscientist Yukiyasu Kamitani, who with Tomoyasu Horikawa in 2017 developed an fMRI method to show how brains that have seen or imagined pictures produce signals that can be reverted into digital images corresponding to those seen or imagined. They argue that "visual features extracted by computational models were successfully predicted from brain activity patterns" (Horikawa & Kamitani, 2017, p. 9). In 2014 the prolific artist and neuroscience researcher Suzanne Dikker collaborated on *Measuring the Magic of Mutual Gaze* with Marina Abramovic, who adapted it from her previous performance *The Artist Is Present*, staged at the MOMA in New York in 2010. The experiment-like setup called for two participants wearing EEG devices to engage in a mutual gaze for thirty minutes while their brain waves were recorded and visualized for the public. Synchronization of the brain waves would trigger a lightning animation, thematizing human connectedness. A similar setting, albeit with no artistic implications whatsoever, has been installed at the National Museum of Science and Technology in Stockholm. In *Melting Memories* (2018) Refik Anadol collaborated with the Neuroscape laboratory at the University of California, San Francisco, to collect EEG data from participants as they recalled long-term memories. A 32-channel Enobio device was used to record brain signals, with a focus on beta and theta waves, which are associated with short- and long-term memory, respectively. These data were then processed using machine-learning algorithms, including recurrent neural networks (EEGLearn), and transformed into three-dimensional visual representations. Notwithstanding the sophisticated machinery used, once displayed in galleries or museums, these works were presented as visual outputs. "Instead of critically probing the workings of brain imagers, artworks on brain images (brain art) glamorize them [...], confirming their representational and indexical efficacy, and do not actually challenge the technologies involved" (Cappelletto, 2022b, p. 92). Literalness prevails over artisticity, as the installation at the Swedish museum confirms.

Despite the magic of immediacy, however, the viewer is not obliged to succumb to the transparent visual rhetoric of those images. In fact, unlike portraits and regardless of their bold assertiveness, brain images do not justify self-mirroring as if they were facsimiles or snapshots of our cerebral condition; nor are they neuronal portraits or personal metonymies. They are rather a step in the process of constructing human beings as entangled in a brain/body/environment system where machines participate in a feedback loop through a multimodal sensible world. Precisely when we consider the second type of brain artworks and focus on the processes entailed in them, we realize that the relationship between the human brain and the brain scan is not vision-based.

Brain visualization techniques were not initially intended for the human brain only and may be applied to other living and nonliving matter, to reveal the composition of the particles without disassembling the main components. Paul Lauterbur, who pioneered MRI in the seventies, originally anticipated the technique finding many useful applications in studying

the "internal structures, states, and compositions of macroscopic and microscopic objects," including human tissues. He called it "zeugmatography," echoing the zeugma, a rhetorical figure that works by joining different parts of a sentence in a single element (Lauterbur, 1973). Such blending is what scanning is about.

Let's now describe how MRI works in humans. In our living body, hydrogen nuclei spins are normally random. When a person enters an MRI scanner, a strong magnetic field causes these spins to align either with or against the field (along the z-axis). A second, changing magnetic field (the x-y-axis) is applied via radiofrequency pulses, exciting the hydrogen nuclei and causing them to precess. When the pulse stops, the hydrogen nuclei relax back to alignment, releasing energy. This energy is detected as the MR signal by receiver coils. Additional gradient coils vary the magnetic field locally to determine the spatial origin of the signals. The analog MR signal is then digitized, and differences in intensity are turned into gray-scale pixels. Each pixel corresponds to a voxel, representing a small volume inside the patient's body. In sum, MRI images are computer-generated visual reconfigurations of physical data such as the relaxation times of hydrogen atoms that are found abundantly in the human body among others. They map the tissue-specific relaxation rates of the protons of water in different tissues (pathological tissues have different relaxation characteristics than healthy tissues, and this is why they are used within the medical context). Finally, the radiologist can modulate the shades of gray dynamically to locate the pathology in a process known as "windowing." Comparisons can also be made by changing the gray contrast in specific areas of the image; this process is known as "leveling."

> The MRI machine does not provide a transparent window into a reality that precedes the imaging process, but nor does it fabricate distinctions. It operates, rather, by instituting a mixed, cross-over environment, where technical and natural elements and forces come to intra-act and mutually influence each other in a law-like manner (Hoel, 2020, p. 310).

No skull has been open.

Despite the "look" MRI has, it is mostly a sound machine (Casini, 2011). The characteristic knocking or rocking sound heard during an MRI scan is caused by the activation of gradient pulses. In every MRI image, there is a combination of both signal and noise: the signal appears as the brightness of each voxel or pixel, while the noise is made up of random fluctuations in pixel intensity, often originating from the patient's body. This noise can interfere with the clarity of the image and needs to be minimized. The signal-to-noise ratio (SNR) of a particular tissue—indicating how much meaningful signal is present compared to background interference—is calculated by dividing the average tissue signal by the standard deviation of the background noise. The sound of the machine and the voices of the radiologist are the first things the person inside the scanner perceives. The narrative MRI produces is an acoustic one. It is not simply auditory though the ears, because listening happens "through the body as a whole and through the technological apparatus (namely, headphones and the bed that vibrates according to the beating rhythm of MRI runs)" (Casini, 2011, p. 85). Reversing Gallagher's understanding of fMRI, the stillness of the person in the scan and the lack of proper visuality of neurological mechanisms are conditions that allow us to dismantle our pictorial gaze in our understanding of brain images as personal representations, once the medial mechanism is taken into account.

It is true that such an enterprise has already been undertaken by posthumanistic thinking (Haraway, 1988), as well as by more recent scholarship in medical visual studies, which argues that brain images should no longer be understood primarily as representations or

signs (Pinotti & Somaini, 2016) but as tools that actively perform functions (Ihde 1998) or as "operative images"—that is, images that do not depict objects but participate in operational processes (Farocki, 2004; Hoel & Lindseth, 2016; Hoel, 2020; Parikka, 2023). However, the epistemic premise implied thereby still relies on the spectator's "looking at". What I am proposing instead is for the whole brain/body/machine embedding to be conceived of as an epistemic-material-medial environment, *made visible* by brain imagers. Brain scans are then far from being transparent. They record biochemical, bioelectrical, physical, metabolic, and magnetic processes occurring at a given moment in some nonvisual matter which is not exposed to light and varying according to the conditions and stimuli to which human beings are exposed, by way of *visibilization* devices (Cappelletto, 2022a, 2022b; Cappelletto & Galimberti, 2023). As Nicole Miglio and Giulio Galimberti have also pointed out, such devices make visible precisely those phenomena "that have nothing to do with the visual realm, nor are they detected by lenses or prostheses that intercept signals from the visible electromagnetic spectrum" (Miglio & Galimberti 2022, p. 71). Accordingly, "brain imaging is not a perfected visual strategy but an image-making practice, technologically heterogenous to previous visual media based on a representational principle" (Cappelletto, 2022a, p. 108). Visibilization makes apparent why there is no transparency as such, since there is no direct access to matter, no point of contact between the image and what is displayed. It follows not simply that nonvisual matter is made visible to the eye, but that a new discourse on individuality opens up. MRI and computer-generated visual reconfigurations of physical data in general enact the brain/body rather than represent it. The very notion of personal identity they configure is therefore entangled, exactly at the moment in which it is pictured. Every form of mediation is itself part of ourselves. Finally, it is not just human beings who behave in medial and cultural environments; machines are too.

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