



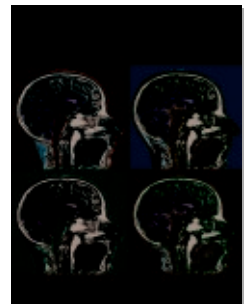
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Toward a Critical NeuroArt for a Critical Neuroscience

David R. Gruber

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Toward a Critical NeuroArt for a Critical Neuroscience

DAVID R. GRUBER

ABSTRACT

Responding to advances in the brain sciences, numerous artists are now engaged in art-neuroscience collaborations, taking the brain as an object of creative representation or adopting the tools of neuroscience. This article reviews several prominent works of “brain art,” examining their critical cultural potentials in relationship to the tenets of New Materialism. The discussion results in recommendations for a Critical NeuroArt to contribute to the burgeoning field of Critical Neuroscience. Analysis of two representative artworks, including the author’s own computational work, *Neuro News Generator*, provides examples of how NeuroArt might proceed.

Cultural fascination with all things “neuro,” coupled with the academic drive for innovative, interdisciplinary entanglements [1], creates ripe conditions for collaborations between artists and neuroscientists. Multiple projects have garnered attention in recent years. Perhaps most prominently, artist and neuroscience graduate Greg Dunn and scientist Brian Edwards constructed the *Mind Illuminated* exhibit at the Mütter Museum in Philadelphia [2]. Displaying massive gilded microetchings of neuron networks shimmering with 22K gold, they dazzled audiences with scale and light, showcasing the visual magnificence of neurobiology with opulent effect. In Dunn’s words, the microetchings “remind us that the most marvelous machine in the known universe is at the core of our being” [3]. The artists’ presentation alongside a title that conflates brain with “mind” unsettles, leaving the viewer unsure about the role of the body in the production of mind and the importance of distinguishing between mind, brain and body; the sparkling neuronal patterns seem easily interpreted (or misinterpreted) as something like neurobiological personality profiles. As a result, one reading of *Mind Illuminated* foregrounds an underlying humanistic impulse that idealizes the body’s architecture and situates neuroscientific representations as exposés of “our being.” Although

this kind of neurocentricity may well be a recurring theme in brain art, not all such works follow the same path.

Other artists, like Jane Prophet, have collaborated with neuroscientists to critically question whether neuroscience can contribute to human self-revelation [4]. Her meditations on memento mori while undergoing brain scanning at Aarhus University intend, as she explains it, to question whether “new imaging technologies increase our understanding of consciousness” [5]. Prophet’s projection of her own brain scans onto 3D-printed heads comes across as academic and notably skeptical about the capacity of neuroimaging to expose anything new about the mysteries of human life. Indeed, Prophet highlights the fact that her scans display but a second’s movement of oxygen across a tiny slice of her brain while she lies perfectly still in a scanner. Her work, then, considers whether neuro-artistic tactics can push beyond the prosaic celebration of brain science or the tendency to induce awe with the complexity of biology.

Of course, some brain art is made explicitly to advance brain research; those works have scientific audiences or alignments with a neuroaesthetics movement whose goal is to describe the neurobiology of aesthetic experience [6]. Brain art, as engaged in this article, refers to efforts to make the brain the object of creative representation or to employ neuroscience as a “tool in contemporary artistic practice” [7]. Visual artist Laura Jacobson offers an example. Working from brain scans, she constructs sculptural models of brains cobbled together out of wood casings, steel bits, auto parts and computer circuit boards [8]. She highlights how the materials of everyday industrial settings contribute to formations of Self, allowing audiences to question how they might be psychologically and physically shaped by work cultures and technological environments. Heather Komus, to take another example, picks wild mushrooms and recreates the soft forms as poisonous (or edible?) fleshy brains. In so doing, she visualizes the impact of soils and eating habits on the evolutionary development of the brain’s memory systems [9].

As insinuated, brain art can be thought-provoking and emotionally stirring, but may well be something of a double-

David R. Gruber (educator), University of Copenhagen, Department of Communication, 8 Karen Blixen Plads, 21.2, Copenhagen 2300, Denmark. Email: grubermailbox@gmail.com. ORCID: 0000-0003-2133-4870.

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edged sword. By way of focusing on the brain and neuroscience, brain art may tend toward celebrating the medical/scientific image and underplay the sociality inherent in its interpretations, roles and applications. Magnanimous brain art projects run the risk of drumming up the Enlightenment and humanist impulses of old realisms without the poststructuralist snarkiness that stages universal knowledge as a self-sealing or self-defeating logic, a folk parody or an uneasy sociocultural construction. Funky brain maps in a SoHo gallery, for example, scream commercial opportunism (at least upon first reaction) and risk looking tailor made to parade the artist as cutting-edge innovator unbound by society's artificial demarcation between art and science [10]. That is, some brain art may wield the "seductive allure" of the neurosciences [11] to reify epistemological privilege through artistic celebration.

On the other hand, public and institutional displays of brain art have the capacity to transform the way that the public sees the medical/scientific apparatus and underscore relations between brains, institutions and lived experience. Brain art can comment on the significant role of neuroscience in our lives or rearrange our ontological prejudices. Some works, such as Jacobson's, highlight ecological development and compel the viewer to question the humanistic conception of self-guided Man. Other works, such as Prophet's, subject brain findings to affective judgments and philosophical inquiry. In brief, brain art can interrogate the power and authority of the neurosciences just as much as intensify preexisting sociocultural discourses of the brain.

NEW MATERIALISM IN BRAIN ART: A CRITICAL REFLECTION

Despite positive potentials, it would probably be naive to believe that adopting neuroscience practices as art practices and transforming brain scans into art objects would not retain some tendency to conflate scientific representations of materiality with identity and emotional experience—and may, at times, do so with the explicit intent to show us who we *really are* [12]. Any analysis should, then, recognize the fashionable impulse to reposition the material thing over social and semiotic constructiveness in hopes of saying more. As in New Materialisms now advanced in cultural theory, a focus on materiality must be balanced with textualizations of the body and the discursive analyses "that have had a good deal to say about the body and its imbrication in relationships of power" [13]. A "turn" to materiality should not supplant critical interpretive processes but complicate them. Here, brain art risks what New Materialism also risks—stressing the agentive capacities of bodies at the expense of how such capacities come to be known, made relevant, symbolically expressed and tooled for use in particular communities.

Janet Wolff harbors this concern, arguing that the general displacement of the "sociological, hermeneutic, semiotic, interpretive" in favor of an "embodied nature" suggests that the "power of images" now resides in "engagement of the material world," obscuring other potentials [14]. If correct, the questions for brain art are when and whether material

engagement reintroduces old anthropocentric or neuralcentric perspectives, and whether artistic reimagination in forms socially compelling inculcates meanings opposed to complex ecological thinking. Brain art, perhaps just the same as other art-science entanglements, can cooperate with restrictive, essentialist conceptions of what it means to be and feel human, especially if reductive understandings of materiality are applied with seeming objectivity and self-assured certainty.

Yet, precisely because of the inherent potential to participate in the interdisciplinary impulses of New Materialism, brain art can interrogate ontological dogma and the "epistemic apparatus" [15]. Brain art can question New Materialism as much as the popularity and privilege of the neurosciences. Brain art can dramatize contemporary debates about matter and materialization and brandish the sexiness of the neurosciences to force a reaction, resituate public medicalizations of stigmatized conditions or expound science as a process of testing, tinkering and sharing. Brain art can perform notable "turns" in the academy just as it can interrogate the status of art and its current technological and scientific dispositions.

ON MAKING CRITICAL NEUROART

As a response to the popularity of the neurosciences, Critical Neuroscience proposes a scholarly practice that examines "the social and cultural challenges posed both to the field of science and to society in general by recent advances in the behavioural and brain sciences" [16]. Inclusive in the effort is a consideration of how power relations and discourses of consumerism and capitalism are reified or reconfigured by the neurosciences. Accordingly, Critical Neuroscience examines scientific processes of development and sociocultural incorporation, looking often at "a gap between promises and expectations [of neuroscience] on the one hand and knowledge and applications on the other" [17]. Yet the role of art in Critical Neuroscience remains as yet unaddressed and unclear.

To expand Critical Neuroscience and encourage creative exploration of institutional and popular neuroscience—which is often charged with propagating "mindless" views [18] and inordinately "seductive" appeals [19]—we might now make Critical NeuroArt perform the social role(s) of neuroscience. Because art interrogates social, cultural and material relationships and fosters audience engagement, it should not be discounted in efforts to build a Critical Neuroscience. More so, because brain art operates within the pragmatic and technological scope of various New Materialisms, thoughtful, iterative, even self-effacing artworks seem well positioned to comment on the nature of art-science entanglements, contributing to a Critical Neuroscience in a way other than in journal publications.

How exactly Critical NeuroArt manifests, of course, remains open and variable. Regardless of materials, means or forms, brain art as Critical NeuroArt would strive for "awareness of the social implications of research and its uses" [20] by taking up the tools, images or discourses of the neurosciences. Prophet's work certainly provides one point of departure as she calls attention to neuroscience practices and

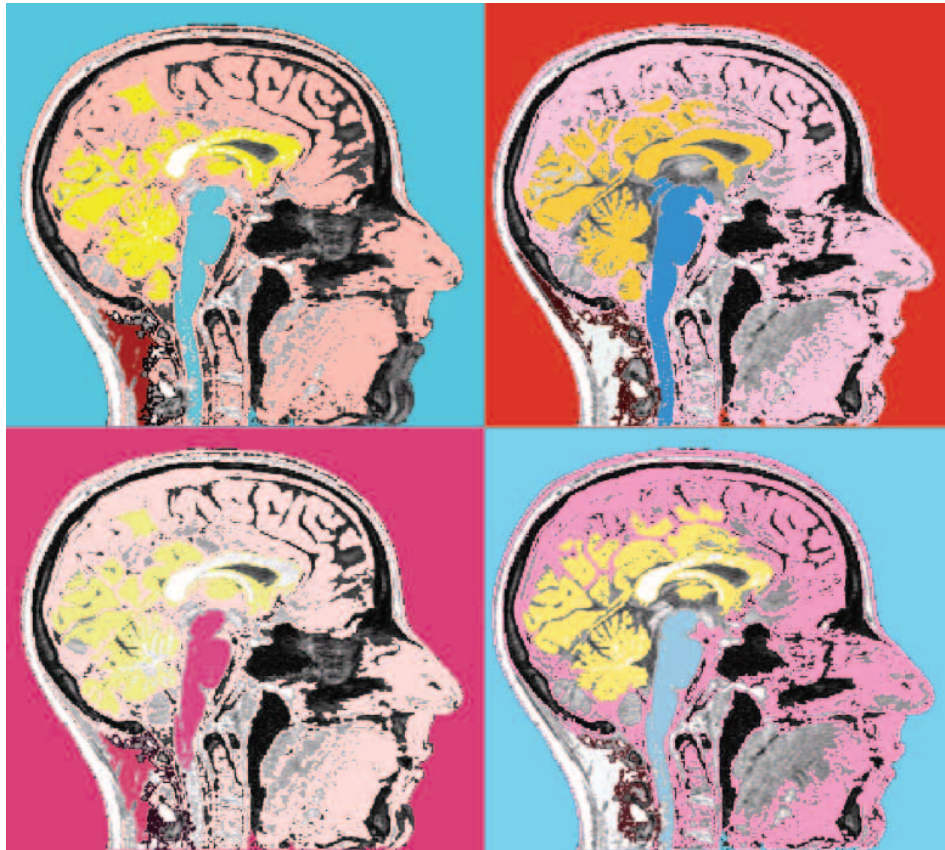


Fig. 1. Charlotte Rae, *Marilyn's Brain*, 2011. (© Charlotte Rae)

thereby questions what the field can (and cannot) say about human experience. However, two other illustrative examples prove useful.

One comes from Charlotte Rae [21]. Her piece, titled *Marilyn's Brain*, intertextually recalls Andy Warhol's (1962) *Marilyn Diptych* [22], tying celebrity adulation to the contemporary neurosciences and positioning brain imagery as part and parcel of consumer culture's wild obsession with self-spectacle (Fig. 1). The second example derives from my own effort to think through the possibilities for Critical NeuroArt. My *Neuro News Generator* demonstrates how a program of Critical NeuroArt need not rely upon complex productions or big STEM grants. The work offers a playful, cheeky parody of popular media representations of neuroscience. Both works demonstrate potentials for Critical NeuroArt to romp on and off the New Materialist stage, to throw open self-conscious and ironical impressions of scientific realism and to create tensions between self and neuroscientific knowledge.

Marilyn's Brain

A modernist adoption of flat visual surfaces turns attention to materials and form—painting as painting without the pretense of realism [23]. In postmodernism, however, flatness adopts a new, playful or cynical recognition of constructiveness. David Joselit puts it this way: “The psychological depth [of Modernism] undergoes deflation, resulting in a [Postmodern] visibility in which identity manifests itself as a culturally conditioned play of stereotype” [24]. As in Andy Warhol's (1962) *Marilyn Diptych*, the deployment of mass

production techniques, repetitive color blocks and celebrity adulation exemplify both desire and disgust for objectification and stereotype [25]. The true or locatable Self dissipates in a (Campbell's) soup of intertextuality. Here, we run square into *Marilyn's Brain*, a flat, glossy image supposedly showing Marilyn (presumably Monroe's) brain, drawing explicitly from Warhol's work.

The playful intertextuality calls attention to neuroscientific celebrity and consumer obsession, suggesting that neuroscience pursues hip topic areas and is easily embedded into sellable pop-psychological contexts. The exposé of *Marilyn's Brain* becomes an extension of capitalism—science gone wild with private configurations sold to the highest bidder. Yet the work displays the limits of the medium and the scan's inability to provide insights about Marilyn, i.e. her personal experience, identity, etc. Or *Marilyn's Brain* might be read as intensifying the male gaze by moving right beyond the exterior surface to penetrate her body, insinuating that neuroscience is yet another arm of masculine domination [26].

Overall, Rae's work stresses the value of ironical social commentary with respect to the heightened epistemological status of the neurosciences. Like Warhol's works, *Marilyn's Brain* insists that “we rethink the meanings of consumption, collecting, visibility, celebrity, sexuality, identity and selfhood” in an age of brain scans when the potential for monitoring private thoughts grows more real every day [27]. Here, *Marilyn's Brain* remakes Warhol's salacious social interventions in context of the contemporary brain sciences, adding a layer of audacity to Warhol's infatuation with what's sexy and sensational amid the contemporary cult of commodification

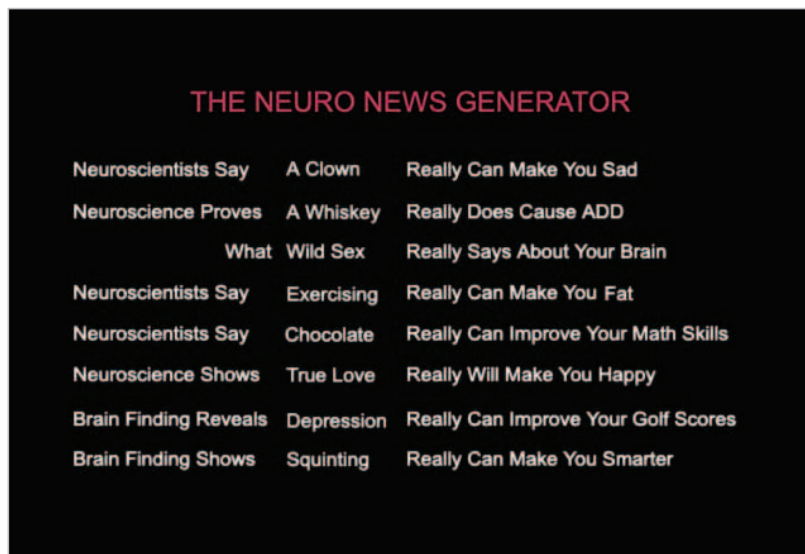


Fig. 2. *Neuro News Generator*, 2017. (© David R. Gruber) Available at www.neurohuman.com/criticalneuroart.

that he so masterfully parodied—and Rae’s work does so by applying neuroscience to the function of the paparazzi, peddling the image of the celebrity brain [28]. Looking at *Marilyn’s Brain*, one finds it difficult not to develop critical interpretations of neuroscience.

Neuro News Generator

The *Neuro News Generator* is a new media project leveraging the Processing programming language to dynamically generate random key words inside fake popular news headlines (Fig. 2).

The online work participates in the broader computational art movement interested in operations, probabilities and new media functionalities [29]. But *Neuro News Generator* aims for a “socially engaged art” that does not necessarily result in radical activism but, as Sjoukje van der Meulen notes, nevertheless retains “a critical ideological subtext” and uses algorithmic functions in a “reflexive way” [30].

Because the work randomly generates “hot topic” words to complete formulaic pop neuro headlines, users are able to question how neuroscience is related to “buzzword” social topics continually gracing lifestyle articles. Watching the stock phrases pop into the same basic sentence structures highlights uncritical presentations of neuroscience even as those same headlines position neuroscience as the ultimate and final word on the “realness” of some belief or habit, i.e. the work (re)generates the phenomena of “neurorealism” as noted by science studies scholars [31]. The algorithmic functionality underscores the speed and potential thoughtlessness of online news in an age where simplifications of science can result from media marketing agendas and financial interests that habitually republish “hot topics” [32]. As intervention, *Neuro News Generator* seeks to *perform* Critical Neuroscience in online spaces where neuroscience news circulates. In a playful mode, the work points to gaps between brain research and how it is represented or applied.

Like *Marilyn’s Brain*, *Neuro News Generator* questions meanings attributed to neuroscience and exposes how political, institutional and cultural discourses converge with material, technical networks to forge power relations. In this

respect, the works comment on the many influences composing neuroscientific “realities,” participating in but also reflecting on (New) material/ist strategies. In fact, both works exhibit how Critical Neuroscience might take advantage of art’s capability to foreground material complexity, to visualize power relations, to engage knowledge-making mechanisms or to deconstruct social conditions [33].

CONCLUSION

With the potential for art-science collaborations to expand, projects that investigate the visual form of the brain or creatively visualize brain function in relation to charged settings would do well to consider, as Joseph Dumit notes, what the production implies epistemologically and ontologically; thinking through “how the person and brain are related” and how neuroscience is rhetorically situated can make or break a project’s critical potential [34]. Just as Dumit says of neuroscientists, project leaders should discuss assumptions in advance and balance what can be known with what remains a mystery. Overall, emphasizing complexity better positions “visual scans of simple difference” within the actual “significance of the experimental data” [35]. In cases where shock, humor or interrogation are desired, artists might, at least for themselves, consider what a work concretizes or invigorates amid strategic omission or exaggeration.

These teacherly considerations for a Critical NeuroArt are offered as instigations to question “construals of nature” and to encourage artists, through practice and material engagement, to challenge “what appears as inevitable givens,” to parody “what counts as natural” and to reimagine possibilities for neurotechnology and neuro-popularity [36]. The goal, of course, is to avoid “either celebrating it [neuroscience] uncritically or condemning it wholesale” [37] but to instead explore its entailments and to twist seduction, fear and excitement into critical thinking about power and sociality. This is what artists do better than most. In fact, as Steven Rose notes, “neuroscience has become too important to be left to the neuroscientists,” and it may well be the arts that can step out of bounds, widen perspectives and reconfigure our approaches [38].

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David R. Gruber is an assistant professor at the University of Copenhagen in Denmark. His research focuses on the neuro-humanities and the rhetoric of the neurosciences.