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Welsh, Paige. *The Brain Scan as Ideograph*. 2022. Chapman University, MA thesis. *Chapman University Digital Commons*, <https://doi.org/10.36837/chapman.000347>

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The <Brain Scan> as Ideograph

A Thesis by

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Orange, CA

Wilkinson College of Arts, Humanities, and Social Sciences

Submitted in partial fulfillment of the requirements for the degree of

Master of Arts in English

May 2022

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April 2022

The <Brain Scan> as Ideograph

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ACKNOWLEDGEMENTS

So many thanks to Dr. Brian Glaser, whose wisdom and curiosity supported this journey. Under his guidance, I was never afraid to leave the mainstream discourses of neurodivergence and mental illness. This thesis has been formative to my research interests and theory of consciousness, and I do not know where I would have been without his enthusiastic encouragement. I also thank Morgan Read-Davidson and Dr. Anna Leahy, who offered extensive feedback and conversation before the defense of this thesis. Their questions and editorial suggestions enriched my writing.

I had many conversations about neurodivergence with friends, family, and colleagues as I wrote this thesis. They, too, were a part of the writing process. I owe special thanks to my partner, Chris, who discussed brain scans with me for months as we ate, drove, cleaned, and walked together. It's a blessing to live and think with him.

ABSTRACT

The <Brain Scan> as Ideograph

by Paige H. Welsh

Medical imaging devices have enabled doctors to render images of the brain without cutting into the body. These images are colloquially called “brain scans.” Through journalism and mass dissemination online, brain scans have become an example of Michael Calvin McGee’s “ideograph,” a language term that subtly takes on outsized political and symbolic meaning to enforce state power. In conversation with theories of new materialism, I situate the brain scan as an ideograph within Jenny Edbauer’s model of rhetorical ecologies. The rhetorical force of the brain scan comes out of a collision between René Descarte’s mind/body dualism, the medical model of disability, and the liberal discourse of madness. As predicted by Michel Foucault’s theories of biopower and Falguni Sheth’s theories of madness and racialization, the production of “normal” and “abnormal” categories legitimizes forcible intervention from the state. Psychiatry justifies limiting the civil rights of abnormal or “ill” by arguing the difference in the body—the brain—eliminates the mind. If the “mind” is not present, then it is not a crime to imprison or abuse the bodies of neurodivergent people. The brain scan becomes the ideograph and material document that reifies the state’s discourse on mental illness. The rhetoric science through materialist eliminationism then defends the brain scan from criticism. To respect the lives of neurodivergent people, we should reevaluate psychiatry and neuroscience through Bruno Latour’s critiques of scientific knowledge and Isabelle Stenger’s call for “risky” research. A post-human approach to the question of consciousness will allow us to reconsider current models of mental illness, justice, and accountability.

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Meaning</u>
CAT	Computerized Axial Tomography
CNS	Cognitive Neuroscience
fMRI	Functional Magnetic Resonance Imaging
MRI	Magnetic Resonance Imaging
NAMI	National Alliance on Mental Illness
PET	Positron Emission Tomography
PTSD	Post-Traumatic Stress Disorder
SPECT	Single-photon Emission Computed Tomography
ToC	Table of Contents

1 Introduction

1.1 The conflict in the social and medical models of psychiatric disability

The medical model of psychiatric disability proposes viewing certain behaviors, beliefs, and moods as symptoms of curable deficits generally located in the brain (Haegele & Hodge 193). While there is no solid consensus on what exactly a disability is, the medical model assumes that the “patient” in discussion is in a “sick role” where their condition is unwanted (Parsons 257). Conflict arises when unruly people with psychiatric disabilities reject the premise that they are ill and decline treatment. A social disability model would ask how a larger social structure that defines some bodies as aberrant generates the problems of psychiatric disability. For example, if someone hears voices that others cannot, do we rush to treat them because hearing voices is a danger akin to an infected wound or cancer, or are the struggles of psychiatric disability caused by a society that reacts with fear and force?

Psychiatrically disabled people will often be subjected to the medical model even if they personally reject it. As a case study, consider California’s laws. The 5150 legal code permits medical professionals or police officers to detain people against their will for 72 hours if those persons are deemed a risk to themselves or others, or “gravely disabled.” (California Legislative Information). If the patient does not seem well enough to leave, a medical professional may extend the hold by 14 days under code 5250. The 14-day hold may be continuously renewed (Disability Rights California).

Although these laws are rhetorically positioned as helping sick people, one must consider the actual conditions and outcomes of involuntarily holds. Both medical professionals and police officers have the power to initiate involuntary treatment, and the criteria they follow are subjective. If someone is “unable to maintain housing” or procure other fundamentals of survival, they may be categorized as gravely

disabled. Anyone experiencing extreme poverty could be considered psychiatrically disabled under California's laws.

During treatment, patients may be kept in a communal space or solitary confinement within a hospital or jail cell (Wiener). Patients also often report feeling unsafe and more anxious in psychiatric inpatient care because of the employees and other patients in the clinic (Pelto-Piri et al.). In a study of 395 patients who had received compulsory treatment, 69% described their confinement as traumatic or extremely distressing in itself (Paksarian et al. 266). There is also growing evidence that involuntary holds may increase the risk of suicide post-release (Wang and Colucci 169). Although involuntary holds are nominally about restoring mental health, consider whether being arrested and placed in a jail cell would have soothed you on the worst day of your life.

If we want to encourage healing and "mental health," traumatizing a person to a point they no longer trust the medical system seems counter-intuitive. Yet, when a patient asks to leave in-patient care, it is "reasonable" to ignore them. A deep discourse, or rhetorical ecology, centuries in the making enables doctors, police officers, and even neurotypical family members to ignore the psychiatric patient's demand for freedom. With the advent of medical imaging, a doctor can now look at the patient and imagine their brain scan as a cover image for this discourse. The brain scan says this is not a person crying out but a body that is damaged and inflamed.

1.2 The brain scan becomes an ideograph within a rhetorical ecology.

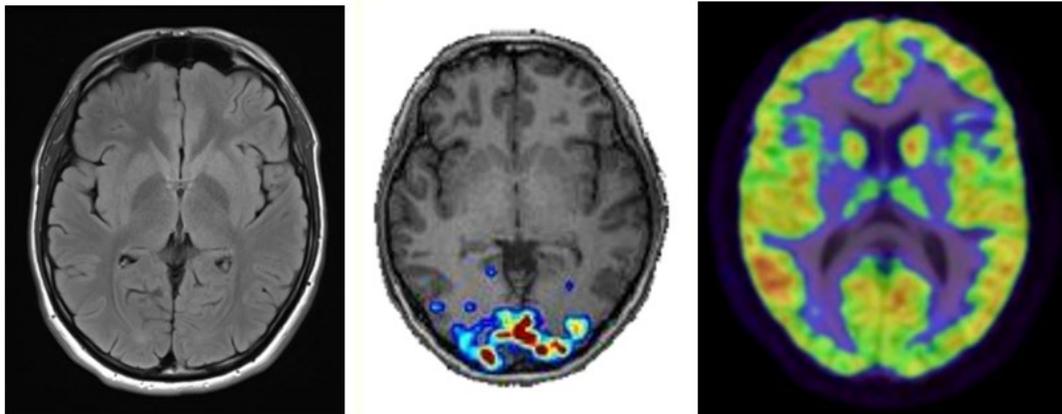


Figure 1: Examples of brain scans.

From left to right: An example of an MRI scan, an fMRI scan, and a PET scan. The MRI scan has no colors because it represents a brain's physical structures in a single instance in time. The fMRI includes colors overlaid to describe the change of blood oxygenation in a brain region over a set period of time. The PET scan indicates the presence of radioactivity in the blood. MRI image from Di Muzio, Bruno. "Normal brain MRI." Case study, Radiopaedia.org. <https://doi.org/10.53347/rID-41113>. fMRI image from Shin, David. "What is fMRI?" Center for Functional MRI in the Department of Radiology, UC San Diego School of Medicine. fmri.ucsd.edu. PET image from Holmes, Sophie, Traumatic Stress Brain Study Group, et al. "Altered Metabotropic Glutamate Receptor 5 Markers in PTSD : In Vivo and Postmortem Evidence." *Proceedings of the National Academy of Sciences of the United States of America*, vol. 114, no. 31, Aug. 2017, pp. 8390–8395.

A brain scan is an image of a brain generated by medical imaging technology like an x-ray or an MRI machine that "sees" inside the body without cutting it. Brain scan images may be three-dimensional renderings or cross-sectional slices of a brain. X-ray machines may produce computerized axial tomography (CAT) scans, single-photon emission computed tomography (SPECT) scans, and positron emission tomography (PET) scans. These scans are part of a field called "nuclear medicine" because they require a radiologist to inject a compound called a radiotracer into the bloodstream of the patient. The radiotracer contains a small amount of radioactive material, usually attached to molecules very similar to glucose, that the x-ray machine can detect. The "activity" in brain scans created through nuclear

medicine is a representation of radioactivity in a brain region. Doctors and researchers interpret a high presence of radioactive tracer in tissue as a high glucose uptake rate (Society of Nuclear Medicine & Molecular Imaging). In the case of cognitive neuroscience (CNS), the rate of glucose uptake is then interpreted as neural activity and can be extraordinarily useful for locating strokes, seizures, and other neurological diseases (Vanitha). Some researchers take an additional interpretive step and assume that glucose uptake in the brain is connected to specific mental activities and illnesses (Rose and Abi-Rached 78). If you see a fully rainbow-colored image of a brain lit-up with “activity,” it is likely a PET, CAT, or SPECT scan. Generally, brain scans that represent “activity” describe the presence of radioactivity over time (Dumit 52). For example, the color red on a PET scan may represent increased radioactivity in a region of the brain over the course of ten minutes, while the color blue represents decreased radioactivity.

Magnetic resonance imaging (MRI) machines produce images of brain tissues with magnetic fields and radiowaves but no hazardous ionizing radiation, making them low-risk for patients and study participants. A plain MRI image will provide detailed images of the morphology of the brain and body. A functional MRI (fMRI) will show changes in blood flow over time. In images of fMRIs, researchers will overlay colors to represent a change in blood flow (UC San Diego Center for Functional MRI). Brain scans that look like a slice of tissue and convey morphological detail are likely MRI or fMRI scans. For both PET scans and fMRI scans, it is important to keep in mind that the presence of color is a representation of data as interpreted by statistical software and the researcher rather than a representation of the tissue itself.

Researchers compose brain scans as a rhetorical text. They carefully decide which machine they will use, which radiotracer will be deployed, what slice of the brain they will image, and what software and statistics package will process the data (Dumit 69-85). In a strictly diagnostic context, brain scans persuade doctors and patients to take a course of treatment for tumors, strokes, aneurysms, etc. However, brain scans take on a special rhetorical force if a researcher prepares them as evidence in a publication. Although an individual researcher may not be thinking further beyond an article they intend to submit to an academic journal, their brain scans will enter a larger rhetorical ecology.

Jenny Edbauer describes the limitations of Lloyd Bitzer's theory of the rhetorical situation, which tidily bifurcates itself into exigence, the problem that sparked the need for persuasion; the audience, the people being persuaded; and constraints, the ideas and material realities that limit the message (Bitzer 1-14; Edbauer 1-8). In her words, "Public interactions bleed into wider social processes. The elements of the rhetorical situation simply bleed." The message, people, constraints, and exigencies continuously shape each other. Although a researcher may imagine themselves composing the brain scan for contained rhetorical exchanges with colleagues and editors, the text is actually entering a rhetorical ecology where doctors, patients, the state, psychiatry, journalism, the internet, the machines, ideologies, and many other elements are going to touch and alter each other.

To rhetorically analyze brain scans, it is useful to put Michael Calvin McGee's concept of the ideograph in conversation with Edbauer's rhetorical ecologies. In a minimalist sketch, an ideograph is an abstract language term that carries rhetorical force because a society's members must agree with its hazy normative goals to maintain social status (McGee 15). In McGee's example, "equality" is an ideograph because if you wish to be an American, you must commit yourself to loving "equality" even if you can't quite articulate what "equality" means in a nation that is socially stratified (8).

Although McGee's ideograph can be critiqued along similar lines as Bitzer's rhetorical situation—its components feel too fixed—the ideograph is still useful if we allow it to "bleed." A rhetorical ecology whose constituents jostle and check each other somehow manages to maintain homeostasis. The discreet power Michel Foucault describes in *Archaeology of Knowledge and the Discourse on Language* needs energy to keep active agents from moving around too much. The brain scan's transmission modes have energy and leave a mark. This analysis also situates the brain scan within new materialist rhetoric. As Diane Coole and Samantha Frost explain: "...the human species is relocated within a natural environment whose material forces themselves manifest certain agentic capacities and in which the domain of unintended or unanticipated effects is considerably broadened" (10). Like the foundations of the ideograph and Bitzer's rhetorical situation, materialism has been historically structuralist. "New"

materialism enlivens even inanimate objects with agency. Jane Bennet describes this as a “vital materiality”—the objects around us have power (6-9).

For example, instead of simply acknowledging that a house exists, we must contend with how the architecture of a poorly designed house pushes us through space with its floorplans, makes us order take out because the counter space in the kitchen is inhospitable, and encourages us to look out at an ugly billboard because that’s the only window with good lighting. This material hostility then alters the inhabitants' ideas of “home” and shapes whether they do renovations or spend more time outside. The house, the residents, and the concept of “home” are all in conversation with each other. Likewise, the brain scan is simultaneously a word, a concept, and a material image. The brain scan has shaped ideology and the people receiving the message. The impact of the brain scan on the people feeds into how they add additional meaning to the brain scan. These aspects “bleed” into each other.

2 <Brain scans> as an ordinary language that poses a normative goal

For the remainder of this thesis, I will use Ronald Lee’s convention of marking the brain scan’s ideographic status by containing it within “< >” symbols (Lee 295).

2.1 A history of comparing heads

To understand the normative goals of <brain scans> we must examine how it is situated within a history of eugenics and phrenology. In *Archeology of Knowledge and the Discourse on Language*, Michel Foucault complicates the relationship between history and documents as a source of knowledge. “The document is not the fortunate tool of a history that is primarily and fundamentally memory; history is one way in which a society recognizes and develops a mass of

documentation with which it is inextricably linked” (7). Society creates and curates its documentation to create an identity through its history, an undertaking that will inevitably be informed by political power. He goes on:

The unity of discourses on madness would not be based upon the existence of the object ‘madness’, or the constitution of a single horizon of objectivity; it would be the interplay of the rules that make possible the appearance of objects during a given period of time: objects that are differentiated in daily practice, in law, in religious casuistry, in medical diagnosis, objects that manifested in pathological descriptions, objects that are circumscribed in by medical codes, practices, treatment and care. (32-33)

In the <brain scan> we have a document situated amongst other historical documents that create the discourse on madness Foucault describes. Because madness is not a concrete object, it must be stabilized by a network of practices and objects. When the <brain scan> is reified into an object, it obscures the discourse supporting it. The materiality of the <brain scan> as a document confuses the abstractness of madness as a concept.

To understand the <brain scan’s> position as a document supported by a discourse, it is helpful to contextualize among its ancestors. In the first half of the 19th century, the pseudoscience of phrenology attempted to predict the intelligence and character of people based on bumps in their skull (Greenblatt 790). As Davi Thornton notes in his book, *Brain Culture: Neuroscience and Popular Media*, today’s neurologists are aware of the legacy of phrenology and use neurologist Dr. Antonio Damasio’s careful rhetorical positioning. “...Damasio claims to avoid the ‘trap’ of phrenology by rejecting a simplistic notion of brain centers. As he writes, ‘There are “systems” made up of several interconnected brain units...(49)’ It’s a small step to go from saying the shape

of the skull is zoned into personality traits to saying it is actually the tissues that are zoned. When a “normal” and a “disordered” <brain scan> are placed side by side, it invites the viewer to interpret the materiality of a brain as evidence of a person’s character.

The focus on race along with poor data mostly delegitimized phrenology to current neurologists. However, peer-reviewed articles on neurology still offer some praise to phrenologists for kick-starting investigations into the brain. An abstract on the legacy of phrenology appears in *The Journal of Neurosurgery* says, “It is important to acknowledge the pioneers of this pre-imaging epoch, who applied creativity and ingenuity to tackle the challenge of reproducibly and reliably accessing a specific target in the brain” (Serletis). The authors go on to describe the race science of the time as “controversial,” and offer no further elaboration. The tone towards phrenology is cautious but applauds the attempt. I bring up this article because even if it is the perspective of just its authors, it survived peer review and was considered fit for publication in *The Journal of Neurosurgery*, a respected journal in the field in 2016.

The side-by-side <brain scan> has uncomfortable parallels to side-by-side comparisons of the plaster skulls used by phrenologists. In *Materials of the Mind*, James Poskett examines how the material props of phrenology were integral to propagating its legitimacy as a science in the public’s mind, even if much of the scientific community had its reservations. The questions of phrenology were based on the preemptive belief that racial categories, social constructs led by the gaze of European colonizers and settlers. While phrenology did take off in other cultures, White phrenologists positioned the skull of a White person as the “normal” against which other races were compared. For example, White phrenologists considered Inuit people “cold hearted” because of cultural differences in burial rights and mapped that culturally biased character assessment onto contours on the skulls of Inuit people (45).

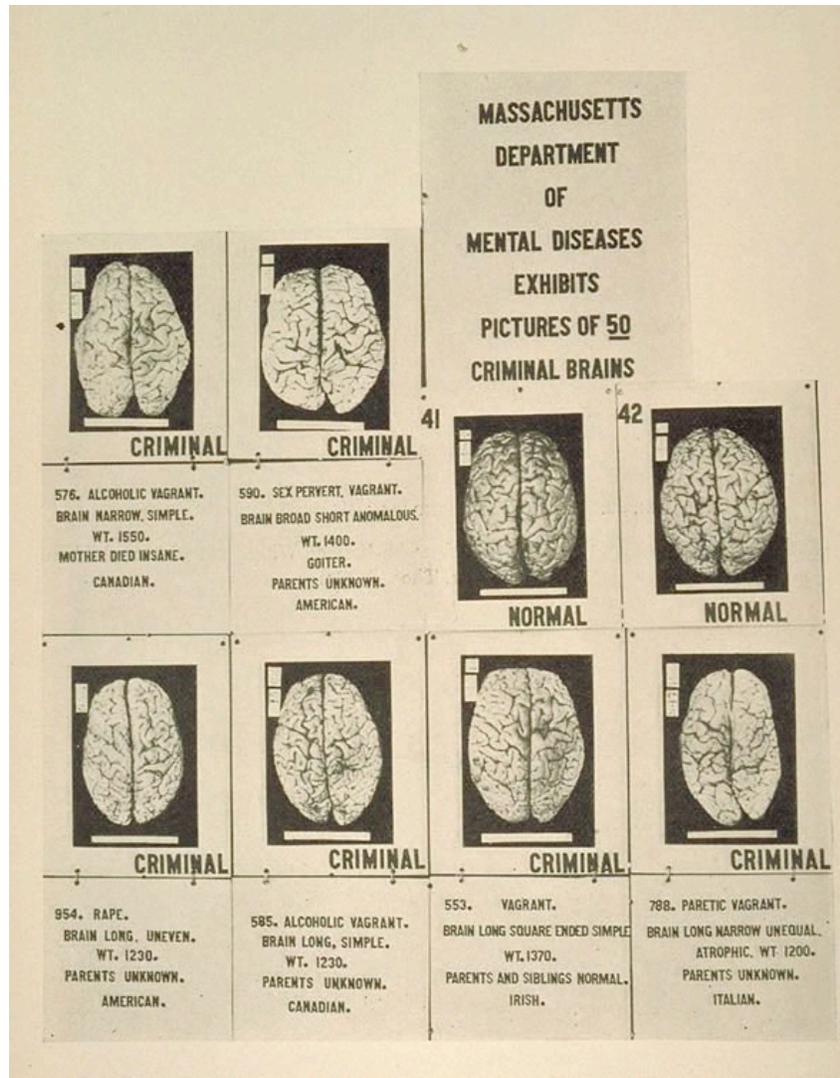
The plaster skull casts were relatively cheap and easy to obtain. The same “samples” were reproduced again and again. Anyone with extra spending money could purchase a few and begin analyzing “the research.”

The authority of the cast was further reinforced through its reproducibility. Most fledgling phrenological societies...purchased a collection from O’Neil and Son, rather than procuring skulls themselves. Adopting the language of print, [George] Combe [a spokesperson for phrenology] described these as “published” specimens. In the end, the material and rhetorical production of an “average specimen” allowed the phrenologists to mitigate the questionable authority of their original collections. (54)

In short, repeated data comes to be misunderstood as abundant data. A century later, we no longer use so many plaster casts, but we do have infinitely reproducible digital images that can be passed around the internet. There’s an uncanny resemblance between the nineteenth-century phrenologist who presents the same reproducible plaster casts, side by side, to the public for interpretation, and the wellness thought leader who presents a digital image of <brain scans>, de-contextualized, side by side on a blog. It is an excellent case study of what Bruno Latour describes as the rhetoric of technoscience: “...a weak rhetoric becoming stronger and stronger as time passes, as laboratories get equipped, articles published and new resources brought to bear on harder and harder controversies” (103).

Accounts from people who have survived strokes and traumatic brain injuries evidence that material conditions of the brain impact cognition (Al-Qazzazz et al. 1677; Arciniegas et al. 43). CNS research can help create medicine and procedures that alleviate tremendous suffering for those who want them. What I want to interrogate are the research questions CNS chooses to

devote its resources to. The search for bodily difference through concepts as political as “madness” or “character” is not objective. In both CNS and phrenology, hypotheses about bodily difference are rooted in socially-constructed premises. “Evidence” is then symbolically represented in mass-produced objects and presented to the public in the name of science education. What is the goal of educating people on the materiality of “normal” and “other”? Who is served?



Cold Spring Harbor Laboratory. Noncommercial, educational use only.

Figure 2: Criminal brains

“Massachusetts department of mental diseases exhibits pictures of 50 criminal brains.” From Cold Spring Harbor, E.06 Eug-2, *Exhibits Book-Second Int. Ex. Of eugenics*, pg 119. Image hosted by eugenicsarchive.org.

In Figure 2, we can see a transition photo from the side-to-side comparison of plaster skulls to the side-to-side <brain scans> of current psychiatry. Taken in 1921, the photos of the “criminal” brains are captioned with terse explanations like “alcoholic vagrant” and “sex pervert.” Except for the brain labeled “rape,” all the criminal brains came from unhoused people, presumably experiencing extreme poverty. Someone in 2022 may balk at blatantly grouping unhoused,

criminal, and mad brains together in this spread. However, recall that as of writing this thesis, police in California still have the power to say someone is “critically disabled” if they cannot house themselves imprison them in jail for their “mental health.” I question if much has changed.

The shapes are described as “short,” “narrow,” or “square.” Knowledge of the parents and ethnicity is also noted. Perhaps most telling is how the two post-mortem “Normal” brains have no explanation at all. They simply are. Those who are ruly do not need to account for the shapes of their brains. Having two normal brains situated amongst six criminal brains also implicitly argues that the route to being normal is narrow, and criminality is diverse. Easier to transport than a case of plaster skulls, the images like Figure 2 benefitted from photography and mass printing technologies. Since then, the printed image has been succeeded by the digital one.

2.2 The mass proliferation of <brain scan> images online and in journalism.

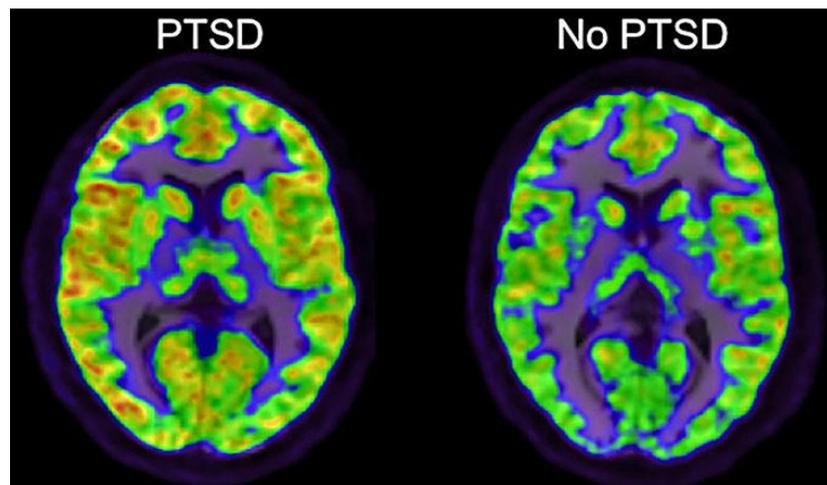


Figure 3: PET scans comparison of “normal” and “PTSD” brain.

A screenshot of the side-by-side comparison of a “normal” person’s brain scan and a PTSD patient’s brain scan from Hathaway, Bill. “New PTSD study identifies potential path to treatment.” *YaleNews*. 17 July 2017.

I initially encountered a version of Figure 3 in a TEDTalk given by Dr. Jay Kumar, a Chapman University faculty member who also runs the university wellness department. As I went down the rabbit hole to find its origin, I discovered the image had a rich life online. Here are just a few places I found it (full citations in the bibliography):

- A Facebook post from the charity PTSDUK.
- A page about a podcast run by Cal OES News, titled “Podcast #79: Lifetime of Emergencies Nearly Sent California Fire Battalion Chief Past the Point of No Return.”
- A post from *Neuroscience News* titled “Potential New Path For PTSD Treatment.”
- A post from *SmallJOYSLife.com* titled “Ariana Grande Shared Brain Scan Showing Her PTSD Years After the Terrorist Attack on her Manchester Concert.”
- A slideshow from *WebMD* titled “How Conditions Change Your Brain.”
- A blog post from *The Center for Law, Brain & Behavior* titled, “Defendant’s Death Sentence Upheld After Ohio Supreme Court Questions Validity of Conclusions Drawn From Brain Scans.”

None of the sources ever claim that the image in question is of a person explicitly involved in the content. For instance, in the Ariana Grande post, the scan is not attributed to Grande, but it is placed adjacent to a description of a study conducted by Dr. Daniel Amen in 2015. Similarly, the blog post about the person on death row uses the scans as the headliner image even though the scan does not come from Anthony Kirkland, the man on trial. If one doesn’t read the fine print, they could certainly get the impression that they are looking at Kirkland’s “damaged” brain. Like the skulls used by the phrenologists, the digital comparison and a normal brain and a PTSD brain are being copied and then dispersed in new contexts for broad public consumption.

I eventually tracked down the original study it came from and confirmed its origin with Dr. Irina Esterlis, a researcher involved in taking the scans. The paper Dr. Esterlis referred me to, “Altered metabotropic glutamate receptor 5 markers in PTSD: In vivo and postmortem evidence,” does not include the exact graphic that she gave to the communications person who wrote the YaleNews article. In Figure 4, you can see that the “healthy control” or HC scan looks quite different from the No PTSD scan in Figure 3. The PTSD scan is also different but less discernably so. In our email exchange, Dr. Esterlis did not explain why the images were different—only that the image in YaleNews came from her and this study. Regardless, Figure 3 came from a study with just 32 participants—16 diagnosed with PTSD and 16 healthy controls. The <brain scans> that have been dispersed around the internet represent just two of them.

The reproduction of the phrenologist’s plaster skulls and then the eugenicist’s prints, are now succeeded by digital reproductions. Perhaps most concerning, digital reproductions can cost nothing to copy and redistribute. As of my writing this in March 2022, Figure 3 is the second result that appears on Google images when I search the terms “PTSD brain scan.” The dissemination of these images without context is easier now than ever in human history.

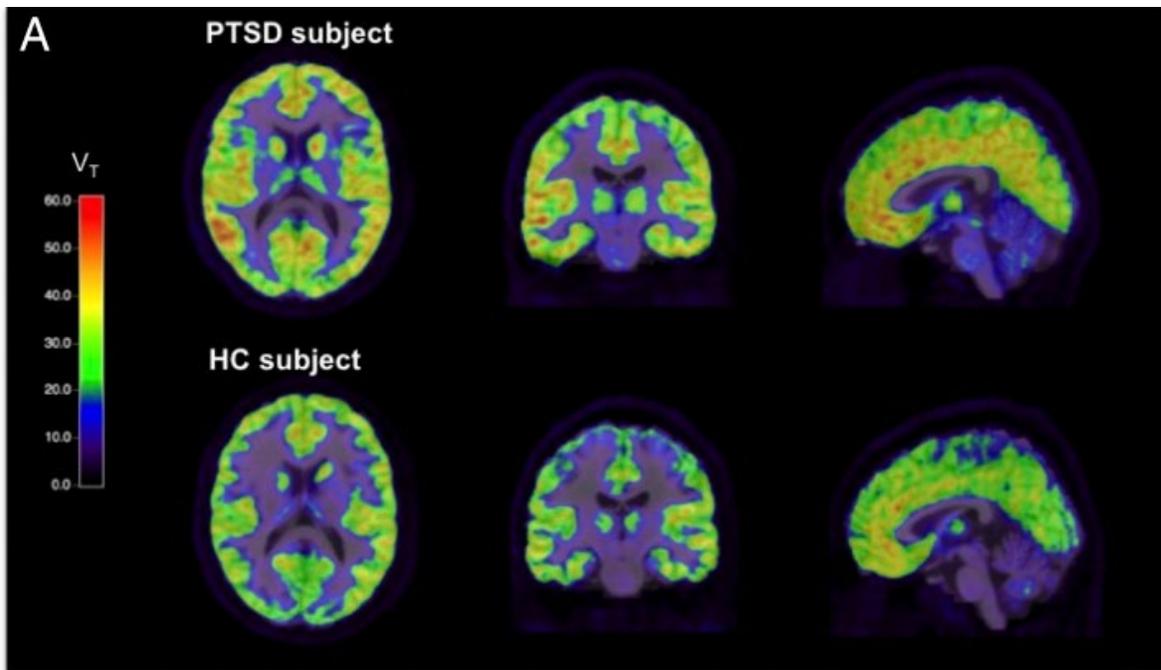


Figure 4: PTSD PET scan image used in original article.

PET scans of a person diagnosed with PTSD compared to the PET scans of a person deemed a healthy control or “HC.” From Holmes, Sophie, Traumatic Stress Brain Study Group, et al. “Altered Metabotropic Glutamate Receptor 5 Markers in PTSD : In Vivo and Postmortem Evidence.” *Proceedings of the National Academy of Sciences of the United States of America*, vol. 114, no. 31, Aug. 2017, pp. 8390–8395.

3 <Brain scans> as warranting the use of power and otherwise unacceptable social actions.

3.1 Mind body dualism, and the creation of empty bodies

Compulsory “treatment” exists in conflict with the medical model that assumes a sick patient who wants treatment. To overcome this problem, psychiatry leans on Cartesian dualism to create a patient who would consent to treatment. The body is estranged from the mind when René Descartes considers the case of a man who drinks in desperate thirst when drinking may kill him, an irrational act. Descartes writes, “Perhaps it could be said here that they erred because their nature was corrupt. However, this does not remove our difficulty, for a sick man is no less a creature of God than a healthy one, and thus it seems no less inconsistent that the sick man got a deception-prone nature from God” (100). Descartes is resolved that God is not a deceiver and does not dole out imperfect minds. The mind is intact and “indivisible” but like a poorly made clock, the body has failed, specifically the part of the brain that governs “common sense” (101).

Implicitly, someone who is irrational, who is “out of their mind,” has something wrong with their brain. Imperfections in the brain block the fruition of the mind God intended. The self is contained in an almost ghostly presence haunting a body. If the mind and body are separate, then there is a ghostly soul, a Platonic essence, of a person untainted by “brain diseases.” In her essay, “Toward a Pathology of the Possessed,” Esmé Weijen Wang describes the treatment of people deemed severely mentally ill in terms of exorcism. Similar to how extreme measures in an exorcism are justified to save the soul sharing a body with the demon, extreme measures of medication and imprisonment are warranted to save the soul of a mentally ill person from their own diseased brain. All protests against interventions from mental health professionals are

interpreted as utterances of the pathology and thus reasonable to disregard. The brain becomes the broken house of the mind or soul.

Here we can now see the urgency to find a corporeal pathology on a <brain scan>. The scientism of the <brain scan> ideograph can be used to “inflict penalties on those who...refuse to respond appropriately to claims on their behavior warranted through the agency of ideographs” as McGee describes (15). If the state can prove “mentally ill” people have a brain disease, all tools to make them ruly are on the table. The tools used, of course, will be decided on a case-to-case basis. McGee is right in that “[a] degree of tolerance is usual”—people with a psychiatric disability who accept their status as ill and consent to treatment can maintain outpatient care, but those who refuse or are unable to become ruly will be imprisoned.

As Foucault describes in *Discipline and Punish, The Birth of the Prison*, modernity attempts to touch the body as little as possible when punishing the unruly: “The body now serves as an instrument or intermediary if one intervenes upon it to imprison it, or make it work, it is in order to deprive the individual of liberty that is regarded as both a right and as a property” (11). If you can convince someone to medicate themselves in outpatient, under the threat of losing their liberty, the state appears to be hands-off. Imprisonment is intended only to punish the mind, and if the mind is absent due to illness, imprisonment becomes morally neutral. Foucault also examines how nineteenth-century laws said crimes committed amid madness were not crimes in the sense of moral accountability, but the punishment, imprisonment, was the same (20). In a society that acknowledges madness as a discourse, every crime could originate in an illness. Thus, this society must talk itself in circles deciding whether the people imprisoned are being “treated and rehabilitated” or “punished.”

In the context of the United States mass incarceration of disproportionately Black, brown, and indigenous people, we must also consider how race impacts what is acceptable in psychiatry. John Harfouch elucidated in his book, *Another Mind Body Problem, A History of Racial Non-Being*, how Immanuel Kant's expansion on the discourse of mind-body dualism theorized people who weren't White, not just as inferior, but as non-existent:

...in Western metaphysics, a sheep is not nothing. A sheep is a being. A sheep has a why, a reason, a ground. The Tahitians are radically other than sheep, since they could be Tahitians or they could be sheep, but they have reason to be neither sheep nor Tahitian. They occupy an alterity not just to sheep but to any being whatsoever, just as non-being designates a radical alterity to being. It is then precisely not the case that the Tahitians are inferior, like animals, but rather they are without reason, or without any ground whatsoever.

(151)

To Kant's thinking, if humans are made to progress culture through rationality and invention, non-White people whose cultures have not "achieved" this are "waste" in God's universe. Harfouch goes on to point out how a rhetoric of non-being is conducive to genocidal thinking. If people are not working as Kant's God intended, then it would be better to annihilate them.

In *Toward a Political Philosophy of Race*, Falguni Sheth defines race as a technology the state uses to preserve itself—"... race becomes a way of organizing and managing populations in order to attain certain societal goals, such as political coherence, social unity, and a well-functioning economy" (22). Drawing from Michel Foucault's theories of biopower, Sheth examines how madness makes surrounding people in society uncomfortable. The strange seem unpredictable, suspicious, and liable to disrupt social harmony. A "real" category is constructed

to mark out an “Other.” “The ‘unruly’ denotes the real in association with its perceived degree of threat” (69).

Anxieties about the presence of mad people walking amongst the rational and their subsequent confinement become a template for racializing other “unruly” populations. Indeed, the history of treating “insane” enslaved African Americans in nineteenth century asylums informed the models of psychiatric care that are replicated today in prisons (Gonaver 173). This also bears out in the data around the diagnosis of psychosis and compulsory imprisonment, which disproportionately affects Black Americans (Schwartz & Blankenship 133). Jails in New York, Los Angeles, and Chicago are also the largest “mental health care providers” in the United States, and they disproportionately imprison Black and Latine people (Sakala; Roth).

Madness and race are intertwined in categorizing the unruly. It follows that in a rationalist liberal society, medical institutions would reach to find a biological marker that categorizes the mad as the eugenics movement attempted to biologically legitimize categories of race. In his book, *Brain Cultures*, Davi Thornton writes, “Brain disease is in [neurologist, Antonio] Damasio’s rendering, a ‘disease of the will’ in that it renders human will ineffective. The conclusion Damasio draws is that individuals should not be blamed or punished for negative behaviors and attitudes that result from these brain diseases” (52). Such a position has profound implications for a justice system that understands imprisonment as punishment for a moral failing. How can it be fair to punish people for a disease? Here we run into the “behavior or belief which might otherwise be perceived as eccentric or anti-social” that McGee says the ideograph legitimizes (McGee 15). The liberal state calls imprisonment “treatment.”

Kant's logic underpins the eugenics campaigns of extermination and mass sterilization. Psychiatry has a sordid history of recommending patients to governments for sterilization and execution (Strous & Brendel 30; Biley 365). The United States had an active program to sterilize the "defectives" and "feeble-minded" throughout the 20th century. Racialized people, immigrants, and the poor are disproportionately targeted in an effort to create a master race (Ladd-Taylor; Black). The way eugenicists feel about disabled and racialized others dovetails in how they perceive there to be "no there there" as far as a mind. For the racialized non-being, the mind is already absent. For the psychiatric patient, the mind is floating above, not quite in the imperfect body. Absent of a mind given by God, it is not a crime to destroy the body.

3.2 Case study: NAMI's bid to end stigma.

In *Science in Action*, Latour describes how science creates myths to explain how people drift from the "straight" linear path of rationality and logic. Knowledge is posited as objective and beliefs as subjective.

What is needed to follow the right path is just a sound mind and a sound method. What is necessary, on the other hand, to account for the distorted path of believers? Lots of factors which can be chosen from among a long list including 'culture,' 'race' 'brain anomalies', 'psychological phenomena' and, of course 'social factors.'" (184)

It is on the nose for Latour to explicitly call out 'brain anomalies.' Now all patients with abnormal <brain scans> are cast out of the knowledge and into belief. It's an old observation that the patient in the care of the psychiatrist has virtually no epistemological standing. Creating <brain scan> ideographs and distributing them to the public for interpretation and consumption legitimizes ignoring patients.

As a case in point, consider how The National Alliance on Mental Illness (NAMI), an organization largely led by neurotypical family members of neurodivergent family members, hopes <brain scans> will combat stigma against “severe mental illness” while also advocating for laws that would give doctors and neurotypical family members more legal power to involuntarily commit and medicate psychiatric patients (NAMI; Rosenberg). I put “severe mental illness” in quotes because NAMI has a problematic habit of dismissing its critics as not understanding “severe mental illness”—a convenient use of the “elliptic rhetoric” Yergeau describes in their book *Authoring Autism*. (NAMI New Hampshire; Yergeau 50). When disability is put on a spectrum, medical authority figures may claim any disabled person who critiques them is not actually disabled enough to have relevant experience. On the flip side, anyone who “severely mentally ill” isn’t well enough to critique NAMI.

There is an important rhetorical hand-off in NAMI’s goals to normalize mental illness. The emphasis on lessening “stigma” is a bid for normalization contingent on treatment. Patients can have a reprieve from “stigma” if they accept they have a disease, as evidenced by the <brain scans>. Of course, if the patient says they don’t have a disease, that denial is more proof they are sick and more laws must be passed to save them. When NAMI manages to pass laws that shrink the civil rights of psychiatrically disabled people, patients are pulled deeper into the medical model and imprisonment even if there is supposedly less stigma against their absent mind.

3.3 Case study: Guilt as a symptom in *The Body Keeps Score*.

The Body Keeps Score, a massively popular self-help book written by psychiatrist Dr. Bessel van der Kolk, has been lauded by many trauma survivors. When he refers to his patient's <brain scans>, van der Kolk attempts to explain their behavior materially in a plea for trauma survivors

diagnosed with Post-Traumatic Stress Disorder (PTSD) and their communities to believe their pain. When communities alienate survivors for experiencing panic attacks, rage, addiction, depression, among other things, a <brain scan> becomes a key come home. The PTSD patient and their community may contain all that unruly behavior to a disease photographed on a <brain scan> like a tumor. The community may then forgive the patient and safely put the traumatic events in the past. Human suffering was a disease the entire time.

In the book, Dr. Bessel van der Kolk diagnosed a veteran who returned from the Vietnam War with PTSD. The trauma that spurred the disease was first the murder of the veteran's friend and then the actions the veteran took in revenge: "The day after the ambush Tom went into a frenzy to a neighboring village, killing children, shooting an innocent farmer, and raping a Vietnamese woman" (22). The text then deftly enfolds the war crime in the language of trauma and PTSD. In later chapters, van der Kolk goes into iterative descriptions of what such traumas do to brains. Implicitly, it is not healthy to feel bad after killing and raping people because guilt is a symptom of PTSD, a disease. The patient can be treated by yoga, van der Kolk's eye motion desensitization, and reprocessing therapy and then move on with their life. As I will explore later in this thesis, I do not see punishment and shunning as a better alternative. However, in diagnoses of PTSD, I observe a mandate not just for the patient but for all people around the patient to forget what happened in the first place. Like the discussion of the trauma inflicted on the veteran's victims, looking back at the war and questioning the state's role in this crime is foreclosed.

3.4 Case study: Jay Kumar's description of American politics as a traumatized brain.

I now return to my initial encounter with the brain scan image in question: Jay Kumar's TEDTalk. The presentation blends the rhetoric of wellness and spirituality with the exclusive parameters of scientific rationality. Kumar's central premise is we can understand United States' political divide between "the right" and "the left" by thinking about the country as a metaphorical brain with PTSD. He presents the mystery scan as a visual aid. "PTSD impairs the inter-hemisphere connectivity in the brain. What this means: PTSD weakens the connection, the communication between the brain's right and left hemispheres. In the same way, America's PTSD drives the disconnect and discontent in America's right and left political parties."

Kumar says that to achieve "health," both sides must communicate; a statement that doesn't even hold up as a neurology metaphor considering dividing the brain hemispheres is a common surgical procedure for people with severe epilepsy. He elaborates, "Likewise, a healthy American democracy requires the operational partnership between America's right and left parties." Kumar suggests that to get past this divide, America must bring up and recognize its past suffering and trauma, which are, in his words, "America's painful past" or "topics such as racial trauma." Considering the mass protests against George Floyd's murder by a police officer that happened in the summer of 2020, I would specifically suggest the racial trauma he refers to is the legacy of slavery, Jim Crow, and police brutality. Kumar then describes the symptoms of PTSD as avoidance and distorted recollection. "It's natural for segments of society to react defensively. This impulse is to deny or downplay the extent of the trauma."

Kumar's framing is a case study in how the scientism of <brain scans> blended with wellness through mental health can be leveraged to support the narrative of dominant power. Mapping this

stance back onto the brain, it seems that the traumatized people here are White people, who want to deny racism. After all, Black people have always had to live with “America’s racial trauma” and navigate White defensiveness to survive. In this framing, White people show signs of clinically certified trauma, even though they are the ones inflicting violence. If you choose to interpret the traumatized ones as Black people, then you must infer that their traumatized memory is “distorted” as well, a convenient rhetorical route for calling legitimate grievance irrational. Because Kumar never explicitly says who is traumatized, who is defensive, and who has distorted memory, you can never quite put together who is committing harm. By never taking a side, Kumar can claim to be on everyone’s side. Of course, when you opt for neutrality, you let the people committing harm center their discomfort with accountability as illness. Rhetorically, the traumatized White brain is wounded, but its soul is innocent. The problem is not a lack of accountability or justice—it is a brain disease.

The treatment for the brain disease will vary depending on who has the trauma and why. If you are White, you can garner victimhood and sympathy for reacting “defensively.” If you are Black, you must accept your trauma is in the past—Kumar maintains the racial trauma is in the past and not an ongoing problem—or be imprisoned for unruly protest. If it seems inconsistent in who is imprisoned versus who may be healed, that is a feature, not a bug. The rhetoric of brain disease can maintain the innocence of the soul and to validate force.

4 Training the public to read their own <brain scans>

4.1 The patient sees themselves as an object.

When we examine the <brain scan> in Figure 3, it is so alien to the anticipated signifiers of the body, people who have not been trained in radiology, or even the specific parameters of the study, would not be able to locate “the normal.” In fact, the <brain scans> don’t look especially different from one another. One has slightly more reds and oranges and fewer purples and blues. It resembles another psychological site of interpretation: the Rorschach test. If it says anything about my mind, I see a squat creature with an angry face in the <brain scan.>

The cut of Figure 3 also looks as if we are gazing down on the brain from above. Implicit is the power to be the looker, and not to be seen. It is an intimate view. We are seeing inside someone, into spaces they would never see themselves. We know nothing of the people who were scanned. and may pour whoever we like into a “normal brain” versus a “PTSD” brain. A normal brain presumably serves a normal person: working, maintaining relationships, sleeping through the night. Implicitly, it is normal to never experience trauma. All people who are more likely to experience trauma—people in poverty, people living in war zones, women, queer people, people of color, disabled people—are also more likely to slip into a scientifically legitimized state of abnormality. If you have suffered, maybe you look at the scans and imagine running yourself through an MRI. You wonder if there is too much redness and not enough eggplant purple in your own head. You, as a member of the <brain scan> ideograph consuming member of a liberal society, are, as McGee puts it, “socialized, conditioned, to the vocabulary of ideographs as a prerequisite for ‘belonging’ to the society” (15).

In *Madness and Civilization*, Foucault describes a process of correcting delusional patients not through force or chains, but by making patients see themselves as objects.

This then is the phase of abasement: presumptuously identified with the object of delirium, the madman recognizes himself ... his solid sovereignty as a subject dissolves in this object he has demystified by accepting it. He is now pitilessly observing himself. And in the silence of those who represent reason, and who have done nothing but hold up the perilous mirror, he recognizes himself as objectively mad. (264)

Dr. Daniel Amen, a celebrity psychiatrist and public advocate of <brain scans>, describes profound emotional reactions from his patients when he shows them their <brain scans>. Some patients burst into tears as they are confronted with the “reality” of their disease (Tucker). I look at the <brain scans> and imagine what my own might look like. I gaze inside myself as an object with disordered colors. To quote Nikolas Rose and Joelle M. Abi-Rached, “The act of seeing...also involves a particular locale for the act of visualization—the designation of a case in the asylum, the ‘demonstration’ of the patient of the patient in the clinic, the dissection of the brain in the laboratory...”(55-56). By seeing a <brain scan>, I bring the lab inside myself.

4.2 Investing in patient status to keep from going crazy.

I’ve described NAMI as neurotypical-led organization that uses <brain scans> to put forward ableist laws, but it’s also important to note that patient-led advocacy organizations use <brain scan> science to garner social acceptance and resources. S. Scott Graham shows how fibromyalgia patients found <brain scans> an effective rhetorical tool for securing social validation and access to medications that relieve their pain. People who have been called “crazy” may find formal diagnostic labels backed by a <brain scan> and the medical model a vehicle to

more options, compassion, and funds through medical insurance (Graham 376). I have no doubt that people with fibromyalgia suffer from their disease, and I believe they are entitled to these resources. I mention this example to point out that sometimes patients have to “play the game” and use whatever rhetorical tools they have at their disposal to get support.

People who have staked their understanding of psychiatric disability in the medical model, or have to convince their insurance company to pay for therapy, have an investment in reifying mental illness in the material through the ideograph of the <brain scan>. The term “crazy” still marks no man's land between “mental illness” and “rationality” that appears in pop discourses among even mental health experts. For example, in an article for *Psychology Today*, psychologist and popular public speaker Dr. Jennifer Sweeton explains that it is helpful for traumatized patients to understand the basic neurology behind a PTSD diagnosis because “...it may help you realize that you’re not crazy, irreversibly damaged, or a bad person.” While Dr. Sweeton intends to be consoling for those she considers ill, her phrasing implies that there are indeed crazy, irreversibly damaged, and bad people. Deciding who is ill and who is crazy will come down to a <brain scan>.

Bruno Latour proposes a post-human understanding of bodies in his article, “How to Talk About the Body? The Normative Dimension of Science Studies.” Instead of seeing a body as a container for the soul, it is a more phenomenological collection of practices that sense difference and complexity. He presents as an example, a cohort of perfumery students who attain “a nose” for perfume as they learn to perceive the nuances of scents. They do not have “a nose” until they incorporate it into their sensory practice. Similarly, the tools of scientific detection become extensions of the scientist, and via this line of thought, the MRI or PET scan machine becomes an extension of the psychiatrists’ or neurologist’s body. They slice painlessly to see inside. Then

through the mass reproduction of images of <brain scans> on the internet, the public gets its own “eye” for a normal <brain scan>.

5 A heretical account of the <brain scan> through autoethnography

Reading accounts of Dr. Amen’s patients weeping upon seeing their <brain scans>, I realized I had the opportunity to get a <brain scan> myself by participating as an “abnormal” subject in a study at UC Irvine medical center. What follows is an autoethnography of that experience. I went out to see if I would be convinced of my patient status once I encountered the ideograph in the form of my own <brain scan>. All criticisms of autoethnography—its lack of scientific standards, small “study sizes”, its emphasis of aesthetics, “narcissism”—may be lodged against this account, and I embrace that (Ellis et al). I am building off autoethnography’s roots refusing the anthropologist’s gaze, and offer this account as a challenge to the epistemological positioning of psychiatric patients in medicine. This is an observation of being observed.

5.1 The process of the getting a <brain scan>.

When I was initially recruited for an MRI <brain scan> study investigating whether my diagnosis influences memory and hippocampus size, I said no. I had an uneasy appointment with the resident who replaced my previous doctor. Since she was still a student, it was unclear if her uneasiness was with her new role as a doctor or the specifics of my diagnosis. Although I had been living well for a year—steady sleep, thriving in grad school, exercising, eating vegetables, the usual checklist—she proposed changing my meds. It felt a bit like when a new manager comes onto the job and to justify their hiring finds something to reshuffle. I declined the change to the meds. She reiterated her concerns but let it go. I was anxious I had lost some credibility by being the disagreeable psych patient.

Being unaware of one's illness is considered a symptom. As an outpatient, it is less of a hazard, but the question lingers. Is there a note on my file that could make problems for me later? It sounds paranoid until you are within the institution of psychiatry. Waiting for an appointment at the hospital, the alarms for a code grey went off. Security guards ran down the hall to stop someone from the in-patient section from doing something—maybe running away or punching a technician. Near my psychiatrist's desk was a prominent button that he could hit to call security. They say it's for emergencies, but you just have to take the doctor's word on that.

When the hospital began calling, again and again, leaving cryptic voice mails, I was afraid they were calling to relitigate my medication. Instead, a woman with a British accent informed me I had qualified for a <brain scan> study. I imagined my brain rendered in the rainbow colors of the PET scan. What if something inside me is misshapen, and I should surrender my judgment to others. I turned her down, but then I began the research for this thesis and reconsidered. I wanted to know what would happen if I saw my <brain scan> as simultaneously an abnormal participant and someone beginning to critique the epistemology of psychiatry. I emailed the researcher leading the study about changing my mind, and we started shortly thereafter.

There were three steps to the study. First, we would have an extended interview over Zoom to discuss my history and double-check that I qualified for the study. Second, I would come to the hospital to do "brain games," essentially memory and cognitive ability tests. At the end of the second session, I would get a blood draw to confirm that my kidneys could filter out the contrast dye used during the MRI scan. Third, I would get in the MRI machine and have the <brain scan>. I was paid roughly \$25 per hour for my time in cash immediately after each in-person session.

The Zoom interview about my history was more emotionally exhausting than anticipated. We went efficiently through some of the saddest months of my life, and I rated those experiences on a ten-point scale or gave a yes/no answers. The questions used to rate my symptoms sometimes gave me pause.

“Have you ever thought that other people were talking about you?”

Well, yes. I talk about other people. Doesn't it make sense that sometimes they talk about me? I don't know how that response was rated.

“Have you ever felt someone was out to get you?”

Yes. One time a man kept hitting on me at work. When I told him to leave me alone in polite office speak, he started to check my copy for typos and forward them to my manager whenever he found them. If I arrived late to the office, he announced it to everyone on the first floor. I don't know how that response was rated.

“Have you ever had a religious experience?”

Sometimes I feel I see my life from a thousand feet up, suddenly at peace. I understand I am doing the best I can, and it's all going to be okay because the world will continue after I die. The researcher said that sounded like a great mindfulness trick. I also don't know how she rated that response. It is amusing to me that most people who regularly attend church get a point added to their psychosis rating. Time and culture have changed the context of what is ill. She also asked if I had ever been diagnosed with PTSD. I said a few experiences in my life were so shocking they altered the way I experience consciousness, but no, I have not been formally diagnosed with PTSD.

The second session took place at the hospital. All the researchers and hospital staff I interacted with were professional and polite. This is likely not representative of all participants' experiences. As a thin White woman with no visible disabilities, people are generally polite to me so long as I am agreeable. Still, at most medical appointments, long waits past your appointment time and clipped interactions with doctors are reminders that you are one of many pressing obligations. Considering how hard it is to find candidates, researchers in a study are eager to make sure you come back to complete all study steps. We started exactly on time, and everyone seemed unusually cheerful.

The night before the study, I had not slept well. Menstrual cramps kept me up, so I arrived on maybe five hours of sleep. I also had considerable "brain fog," so my results were going to be extra abnormal. Here are a few of the activities I completed in a quiet office with the researcher. I drew a line through a maze as quickly as possible during one. By the final maze, I had developed a maze running strategy and did the final maze faster than the previous ones even though it was more complicated. The researcher commented that that had never happened before. In another activity, she read out a list of items and asked me to recite back as many as I remember. Another, I looked at six images of simple geometric figures and then drew them to the best of my memory. We repeated this with the same six images three times. The impressions of the previous drawings were etched in the paper, so I focused on memorizing new components. By the third try, the reproductions were perfect. I didn't mention my "cheating" because I felt it wasn't my role as the participant to critique the study design.

I struggled to translate symbols into a list of numbers based on a key at the top of the page. Although I am right-handed, I hold pens like a leftie. My forearm covered the key because of how the activity was laid out. I had to lift up my arm and adjust the paper whenever I wanted to

check the key. Generally, after an activity, the researcher told me I did a great job. Based on her less enthusiastic reaction to the symbol translation activity, I sensed I tanked it.

We moved on to computer activities. During one, I watched stock photos of innocuous items flash across the screen. After a short break I watched more stock photos flash by on the screen, and if I saw a repeated image, I would click. I am trigger happy. There were several where I clicked and then realized I had actually not seen the item on second glance before. My read-out probably said I remembered many rakes, bananas, and toy trucks that were actually brand new. There were many more activities. I suspect by diversifying the tasks, the researcher hoped to average out problematic results, but I can't know for sure until they publish. This is a reasonable research practice. I believe the researchers were doing their best to get objective data with the peer-reviewed tools they had available. However, I bring up the limitations of their study design so you can understand how many factors impact the quantitative data psychiatrists lean on. It is exceedingly difficult to get controlled data from research subjects as complex as human beings moving through the world.

I was offered many cups of water throughout the brain games to keep my veins plump for the blood draw. The researcher handed me seventy dollars cash and a fruit leather snack at the end. I walked to the blood work clinic in a different building. Although we were still amid the coronavirus pandemic (Nov 2021), the room was packed with older people wearing masks. Six feet of distance was crunched down to more like 2-3 feet. It occurred to me that if I was to get COVID-19, this would be just the place. I am also afraid of needles. I could see how many participants would decide to take the money and run at this point—something the paperwork made clear I had a right to do. I went through with the blood draw anyways. The seasoned hospital phlebotomist got my vein on the first try.

Around two weeks later, the lab confirmed that my kidneys could filter out the contrast dye. I scheduled an MRI for the evening when the hospital was much quieter. When I arrived, I filled out a few forms, and shortly after changed into a hospital gown. All bits of metal, wedding ring and glasses included, had to come off and stay in a locker. The room with the tube-shaped MRI machine in the center was surprisingly spacious. The technician instructed me to lie down on the table and explained the basic procedures as she gave me foam earplugs and a rubber bulb on a wire. I may feel a bit warm in the machine, but if I felt burning anywhere, I should squeeze a bulb immediately to end the scan. She gave me a headset that played soothing ambient music ideal for contemplating fish at the aquarium. Then she put a sort of plastic cage on my head. It included a mirror that allowed me to look past my feet out the tube. The table I was lying on began to rise, and she put the IV in my arm. I don't have enough experience with IVs to know how they typically feel, but this one dully hurt throughout the scan. It was essential to keep my arm with the IV still and straight.

The table slid into the machine. I'm not claustrophobic, but I would not say it was comfortable. Between the snug space, the strange banging of the machine, the aquarium music, and holding myself very still, I felt like I was in the escape pod of a science-fiction movie. The scan lasted about 40 minutes. Halfway through, they pumped in the contrast dye. I felt its coldness run inside me. Towards the end, my arm was cramping from holding still in a perfectly straight line, but I was careful not to move because I didn't want to restart. The scan was successful. I came out of the tube, got dressed, and another researcher paid me again in cash. Although I was paid and everyone I interacted with was polite and professional, I wouldn't participate in a study again. It was too much hassle and discomfort.

5.2 A heretical interpretation.

My interior experience and thoughts were not significant to the MRI scan because it measured physiology rather than activity through glucose uptake. However, the act of staying very still through a somewhat uncomfortable 40 minutes would be difficult for many people, especially for the “abnormal” candidates this study was seeking. I had to be a very ruly body to participate. Throughout the study, I observed the difficulty of holding onto patients. Consider the criteria steps that might have pushed someone to drop out.

Abnormal candidates must:

1. be willing to be participants in a study led by researchers they may not trust based on previous experiences with psychiatry.
2. be “stable” with no recent changes in medication.
3. not have an additional diagnosis that may confound the study.
4. have a good internet connection.
5. be willing to share about an hour of personal information with a stranger.
6. be willing to come to the hospital in a pandemic.
7. have transportation to the hospital.
8. be willing to do a few hours of puzzles and memory tasks.
9. be willing to get a blood draw.
10. not have any metal in their bodies from previous surgeries.

11. be willing to change into a hospital gown.

12. be able to lie still for 40 minutes with an IV in a loud, claustrophobic tube.

Undoubtedly, there are other obstacles I have overlooked.

I can understand why these studies are difficult to fill. I am an odd patient for being able to check all these boxes. I imagine PET scan studies, which require radiated injections, would be even more difficult to recruit because it includes more risk. I cannot speak to the exact experience of PET scan study participants, but I imagine that they also have a strange, uncomfortable day pulled from a science fiction movie. I am skeptical that the image of glucose uptake during a “mood” or “thought” produced in a PET scan would represent glucose uptake in day-to-day life.

Before I got to see the <brain scans> themselves through a web portal, the radiologist included a note that read “normal MRI of a brain.” It’s unclear if they meant a typical framing for the image or if the brain itself looks normal. The report went on to say there are no signs for concern, like tumors, herniation, hydrocephalus, or extra-axial fluid collections, amongst other things.

Although this <brain scan> was administered to identify a mental illness, the radiologist saw nothing that would threaten my life or well-being.

When I opened the files, it was bizarre to recognize my profile and then try to categorize what I saw for a few moments. It was somehow surprising that it so closely resembled what I saw in textbooks. Subconsciously, I did believe there was going to be something odd. The image is strictly black and white because it contains no statistical interpretation. Should I see it in a academic journal, it may be amalgamated with the other abnormal brains and then marked to show what is too large or small. In medical imaging, we search for what is wrong, what is

curable. It is unexpected to look at ourselves through the machines with neutrality. I did not cry like Dr. Amen's patients. If anything, I saw my <brain scan> and felt fine with myself. Is my body wrong if I am happy and conscious? I'm just grateful to be here.

McGee says such a heretical interpretation will be punished, and maybe that is why I chose to not share the scans in this thesis. They feel somewhat obscene in a public place. A few of my friends and family members have seen the <brain scans>, and most felt they were unsettling. They had seen the <brain scans> of anonymous strangers and felt indifferent, but a slice of someone they knew felt like an invasion of privacy, like I had shown them a clinical picture of my breasts. Yet, maybe that discomfort is the mind/body dualism tugging at us. How could I be a person and a brain at the same time? It is discombobulating to see a person holding the ideograph that implies they are an empty body.

Should the images be published, I would consider claiming them as a social experiment. I imagine posting a picture of myself holding a print-out of the study, grinning with a caption that says, "That's me!" When people hear of my diagnosis, they imagine an unhappy person and an unreliable narrator. Both are sometimes true, but they are sometimes true for everyone. Being conscious is difficult. Something about a smiling Ph.D. candidate holding the "proof" of their aberrance would rustle the story of the dualism. It might also cut off career opportunities. Colleagues with similar diagnoses have advised me not to go on the record about my specific experience lest I want administrators to push me out. In the privacy of my home, the <brain scan> persuades me in one way. Outside, it would persuade the world in another.

6 How did the science get us here?

6.1 When bad science attempts to reify culture

Researchers have been scanning brains in search of a cohesive marker for mental illnesses for decades. Yet, when you go to the psychiatrist, you are not run through a PET scanner or MRI machine to get a diagnosis. There are several explanations for this.

Psychiatrists Surjo R. Soekadar and David Haslacher frankly state that they only use <brain scans> to rule out pathologies like acute head trauma, stroke, or tumors. Discerning PTSD, OCD, depression, borderline personality disorder, autism spectrum disorder and schizophrenia is, to date, impossible (20). Individuals with the same diagnosis have a high amount of variability between scans, and these diagnoses often blend into each other. For example, it's common for someone diagnosed with an anxiety disorder to also have compulsions or be depressed. If you leaf through most pop explanations of <brain scans>, the amygdala, prefrontal cortex, and anterior cingulate cortex come up over and over again across most diagnoses. It seems <brain scans> may be photographing misery as a correlation, but not causation of DSM diagnoses.

Critics of <brain scan> studies have also noted how the processes for selecting candidates and running the scans complicate the data: Small data pools—often around 12 “abnormal” participants and 12 “normal” participants—do not produce statistically robust data (Thibault and Raz 55). Fidgeting during MRI scans creates shadows on the images, which may explain why post-mortem examinations of “tissue loss” do not replicate scans (Thibault and Raz 56). The act of lying down also changes the neural activities PET scans seek to measure (Thibault 59).

Generally, participants are not in their usual state of mind during their scans, and those willing to

participate are probably not representative of the patient population at large. In his book *Picturing Personhood*, Joseph Dumit describes how the participant selection process for PET scan studies of people diagnosed with schizophrenia tends to position “normal” as white, male, drug-naive, and right-handed (63). Finding enough white, male, right-handed drug-naive people diagnosed with schizophrenia becomes an enormous challenge. Even if they are successful, we should be rightly skeptical of whether this tiny slice of the population can represent a state of consciousness for all of humanity.

Scientists also concede their rhetorical aims in placing the images side by side. In a publish-or-perish academic landscape with limited funding, they choose the images that display the most dramatic differences to make their point (96). Beautiful PET scan images can put their research on the cover of academic journals and news outlets, a boon to their careers (57; 99). The point is not to render the most accurate representation of the data, but the most persuasive. Yet when their studies fail to replicate, no one alerts the press.

The other limitation of <brain scan> studies is the assumptions underlying the proposed hypothesis. In her analysis of a <brain scan> study that attempted to pin down a difference between men and women in brain activity related to humor, Christa Teston demonstrates how null hypothesis significance testing can become a rhetorical tool that validates socially constructed assumptions. If you go looking for differences between men and women, a minor finding can be infused with disproportionate meaning. The premise of the hypothesis itself seeks a biological basis for socially constructed imaginings of masculinity and femininity. The statistical findings were slim but still publishable. Now the pop-science journalist may take the interpretation a step further and claim that women just don’t understand a good joke. To quote Teston:

The problem of “bad science” is greater than ideological constructions of what counts as fact or sensationalized accommodations of scientific facts to lay audiences. The problem of bad science is as much ontological as it is ideological or epistemological. It is as much material as it is linguistic. (48)

When investigating psychiatric diagnoses through <brain scans>, we must also contend with how the Diagnostic Statistical Manual (DSM), the authoritative text that dictates who is diagnosed with what disorder, is also culturally constructed. The DSM frequently changes. Diagnoses are added and discarded by vote at the American Psychological Association. Looking back on the DSM’s history, we find a slew of obviously socially constructed “illnesses,” the poster child being “homosexuality disorder.” Disorders such as “victimization disorder” and “masochistic personality disorder” have also been discarded once their existence became difficult to defend politically (Kutchins & Kirk 8; 149). The inclusion of PTSD in the DSM was largely due to political organizing from veterans’ groups, seeking more social support for traumatized veterans (Kutchins & Kirk 100). Like the search for sex difference, the search for data on psychiatric diagnoses through <brain scan> starts with a social category and then seeks data to validate that difference.

In her book, *Screening the Body*, Lisa Cartwright investigates how film and photography mediated medicine’s move from studying symptoms to sites of disease in the body as predicted by Michel Foucault in *The Birth of The Clinic, An Archeology of Medical Perception*. Before the time of the PET scan, neurologists created photo documentations of “hysterics” experiencing “pathological movement.” The intent of the photos was to ground mental illness in the empirical realm, particularly since Freud’s psychoanalysis was threatening the corporeal basis of insanity being pursued by contemporary eugenicists. The mode of visual rhetoric flattens the

photographed person into objectivity, both in that it carries the scientism of “objective data” and that the objectified person cannot speak back. Then she goes on to note how a film of a patient regaining consciousness after a seizure is cut short the moment he looks at the camera.

The neurological filmmaker is made uncomfortable by the comprehending gaze of the patient, not because her look challenges the authority of his gaze, but because it reminds him of his own inability to discipline the bodies of his charges, to make them perform their illnesses on cue and involuntarily. (80)

Reading Cartwright, I think of how I disciplined my own body for the MRI scan in the <brain scan study>. I was instructed to keep my arm with the IV straight and perfectly still for the duration of the scan. After 30 minutes, my arm began to cramp, but I held myself still so we wouldn't have to start over. My ruliness enabled an image that will likely be used to train scientists in seeing an abnormal body, but paradoxically one that could be disciplined. I can approximate health with treatment, but inside me, there is still something presumed to be fundamentally “Other.”

6.2 The problem of the voxel and the eliminationist materialism.

Here, it is worth visiting a passage from Foucault's *The Birth of the Clinic*:

In the rational space of disease, doctors and patients do not occupy a place as of right; they are tolerated as disturbances that can hardly be avoided: the paradoxical role of medicine consists, above all, in neutralizing them, in maintaining the maximum difference between them, so that, in the void that appears between them, the ideal configuration of the disease becomes a concrete, free form, totalized at last in a motionless, simultaneous picture,

lacking both density and secrecy, where recognition opens of itself onto the order of essences. (9)

One can easily apply such a scene to the neurologist poring over the <brain scan>. If they could just clear all this damned static—the body in the way—the essence of a brain disease would speak in the scan.

Rose & Abi-Rached, Dumit, and C. Fred Alford all point out a problem of scale in <brain scans>. <Brain scans> often describe tissues in a standard unit of measurement called a voxel, one millimeter of tissue cubed (Alford 86). Although it is around the size of a grain of sand, a voxel of brain tissue contains many millions of neurons. The assumption that a voxel is the appropriate unit for measuring brain activity is driven by the PET and MRI scanner parameters. A few neurologists with a sense of humor did an MRI <brain scan> of a dead Atlantic salmon and found that the voxels of dead fish’s brain matter were “lighting up” as they “saw” photos of social situations. In the subsequent poster presentation, they wrote, “Can we conclude from this data that the salmon is engaging in the perspective-taking task? Certainly not. What we can determine is that random noise in the EPI timeseries may yield spurious results if multiple comparison are not controlled for” (Bennett et al.).

In the unit of the voxel and the quest for experimental “control” we may find an apt metaphor for the problem of eliminationist materialism emblematic to <brain scans>. In saying the problems of the MRI scan are uncontrolled results, there is an implication that with proper study design and perhaps better technology we’ll get to the bottom of it. The neurologists will one day snap a proper photo of brain in the midst of an emotion or condition. Without predicting the future of <brain scan> capabilities, I want to examine *the assumption* that <brain scans> will inevitably

advance to validate narrowly asked questions. It seems hardly scientific to select a predetermined outcome and then use science to validate it. What does this atomized version of the mind mean to the scientific world view?

John Kihlstrom describes the material eliminationism of the belief that our understanding of mental phenomena becoming tied to our material neurology as “a rhetoric of constraint” (759). The idea that the material condition of the mind will reveal “the truth” at the level of neurons closes off discussion of consciousness as an emergent property. If you asked me what riding a bicycle is and I labeled all the atoms involved in the titanium, it would not be so helpful as me showing you a bicycle in action. We may also consider Robert Pepperell’s metaphor of consciousness:

Consciousness can only be considered as an emergent property. In this sense it is like boiling: given sufficient heat, gravity and air pressure the water in a kettle will start to boil. We can see what boiling is, we can recognize it as something to which we give a name, we do not consider it mysterious, yet we cannot isolate it from the conditions which produced it. Likewise, consciousness is a property that emerges from a given set of conditions.

No doubt, understanding kettles is a useful and interesting enterprise, but a kettle is not the phenomenon of boiling. Still, CNS hopes that by getting more sophisticated instruments dissecting the kettle on the molecular level consciousness will become clear. Even if they do find a material difference in the bodies of neurodivergent people, what does it mean to them? When “non-scientists” critique atomization, they are not just being sentimental. There are other viable questions in play if we permit ourselves to consider them. Atomization may be taking us further from the appropriate scale of the question. The voxel of the <brain scan> is simultaneously too

large to capture the activity of neurons and too small to capture the experience of living in a complex environment.

In the tradition of positivism, anyone who critiques the quest for empirical atomization is cast as “unscientific” even though using data to drive at a predetermined solution is rather unscientific itself. Stengers describes the problems of positivists in her book, *The Invention of Modern Science*. Aligned with Foucault, she observes how controlling factors in the lab for the sake of medicine demands reducibility and turns all other factors—the patient, the complexities of living outside that lab—as obstacles. She describes the positivistic drive to reduction and elimination as a “mobilization,” an almost militaristic deployment of science, particularly quantum physics, to conquer all spaces of knowledge. “The great mobilizing narratives have always defined progress in the mode of asymmetry: the power of the person who advances in the name of science, and who is distrustful of the ‘opinions’ of those who occupy the territory to be subjected” (118). The ones who occupy the territory in the case of neuropsychiatry in this case are the disabled people who may like to decline treatment, but alas the tanks have already rolled in.

Stengers also writes, “The sciences are not, by destiny, the allies of power, but they are, by definition, vulnerable to all those who can contribute to the creation of differences, the stabilization of interests, the disqualification of annoying questions, the facilitation of the product of laboratories” (125). When applied to medicine, scientific mobilization driven to reduce is especially susceptible to political efforts like eugenics. The quest to isolate diseases into a heritable trait and the logic of removing “imperfections” from bodies or the human population at large fits comfortably with the drive to atomize until science can draw a boundary around complexity and excise it.

A chemist herself, Stengers proposes not dismantling the sciences but creating a rhizomatic network where “the public” and other “non-scientists” may speak back on the production of knowledge. This is not at the detriment of “good science.” Instead it pushes science into a riskier place, outside the lab where the real world adds complexity. When I was a participant in the <brain scan> study, how would the assumptions of the study have been changed if I could have told the researcher conducting the interview that their question was poorly asked? What if I could have asked what they intended to know and helped them reformulate a better question? It likely would have taken more time and money than their grant permitted. Their colleagues may have scoffed at polluting a respectable science with uncontrolled variables, but I suspect the knowledge generated from such a study would have been more useful than another spread of voxels.

7 **Rethinking accountability and neurodivergence**

Calls to return to mass sterilization and genocide are currently outside of polite political discourse, in that most politicians can no longer openly condone the practice in American politics. However, the call to return to an asylum system, where the mentally disabled will be warehoused out of sight, is still on the table. In addition to the existing policy of mass incarceration in jails, Pres. Donald Trump proposed bringing back mental asylums as a solution to gun violence (Freking). Vice Pres. Kamala Harris also proposed in her 2020 campaign an expansion of powers to forcibly medicate and confine psychiatric patients to the dismay of disability activists (Luterman). This is all to say, eugenics is a light sleeper and identifying how it moves rhetorically in public discourse has high stakes.

When discussing my research with people in my life, the conversation often takes a turn where the other person either tells me about their grief for a neurodivergent family member or their fear of mass shooters. Couched in these stories is a question: “But what am I supposed to do when I am scared?” I acknowledge there are circumstances where we must stop harm. If someone is standing on the edge of a bridge, ready to jump, we should try to save them. If someone is hitting another person, it is justified to use an amount force to stop the assault. No neurotypical or neurodivergent person is obligated to absorb abuse. In our current situation, we often find ourselves boxed in with poor options. What will it be: the prison or the street? Sometimes neurodivergent people do hurt others in a state of confusion, fear and/or rage, and discussing the abstractness of social constructs usually does not make the injured party feel better.

The frustration families feel when I critique NAMI and psychiatry is legitimate, but misdirected.

Are we actually happy with the current situation? I borrow extensively from Angela Davis's book *Are Prisons Obsolete?* in my thinking here. Instead of changing the law to expand institutionalization, it's time to address ableism, racism, homophobia, misogyny and poverty. It's a daunting project. As Davis puts it, "...rather than try to imagine one single alternative to the existing system of incarceration, we might envision an array of alternatives that will require radical transformations of many aspects of our society" (108).

I've never heard of a disastrous outcome that wasn't first paved with years of suffering and ableism. In my own experience, neurodivergence can feel like experiencing consciousness with high malleability. You can learn what to let in and what to let pass through, but you need time and support to practice. I can easily see how even well-resourced neurodivergent people struggle to thrive as their communities tell them again and again that they are shameful, scary burdens. When well-meaning families rush to enroll in NAMI support groups to grieve the existence of their neurodivergent family members, their ableism is absorbed into their loved one's consciousness. We need to interrogate our fear when encountering neurodivergence. Is there a problem or are we just encountering the unexpected? Is anyone actually being harmed? If someone must intervene, what is the least forceful way to do so? Respect the person before you as a complete mind and body fusion, rather than grieve for an ideal essence that was never present in the first place.

Ostracization and the violence of incarceration compounded with housing and food insecurity set neurodivergent people up for terrible outcomes. I suspect stereotypical symptoms of mental illness are not destiny but the uniquely visible form of neurodivergent misery in a hostile world. This approach is like looking at everything but the <brain scan>. Instead of asking what is wrong inside the brain, we ask, how is the world marking this body?

Part of respecting the personhood of neurodivergent people is also rethinking accountability. NAMI thinks it is helping neurodivergent people by saying a disease is at fault when they commit harm. I disagree. For the sake of your relationships, if you hurt someone, even by accident in the midst of mania or psychosis, you should apologize. NAMI's desire to blame the disease comes out of the correct intuition that something is wrong with the justice system. However, instead of rethinking prisons, the NAMI proposes scaling up incarceration while removing formal criminal convictions. Erasing accountability sows resentment. It disrespects both the harmed and responsible party and feeds into narratives about disability as a burden. Instead, we should ask how neurodivergent people can be treated as whole and accountable persons in a community without prisons? This model creates respectful boundaries that leave everyone better off.

Earlier in this thesis, I discussed the case of the veteran in *The Body Keeps Score*. I find this book frustrating because van der Kolk nearly reaches a social model of disability. We are our bodies. We are material, and the material world marks us. Trauma is underacknowledged in psychiatric treatment. He has acknowledged the touch of the world on the margin of the body, but then focuses only on certain bodies for treatment. When I read about how the veteran had committed an atrocity in Vietnam, I was disturbed, but I also remembered a news story I had read some time ago. After struggling with PTSD for decades, American veterans returned to Vietnam to complete works of restorative service like removing land mines. Their "brain diseases" abated once they atoned and spoke honestly about the harm they had done. To quote a veteran named Chuck Searcy said, "When I'm in the United States, the Vietnam War haunts me every day and every night. When I'm in Vietnam, the American War has been over for 45 years" (Graceffo). It's a radical "cure," yet so intuitive.

Van der Kolk can't approach solutions rooted in social justice because he's so focused on his ideographic <brain scans>. It's not a coincidence that restorative action after a war opens difficult questions. If we begin acknowledging "the enemy" is actually just people, the state is going to struggle to justify the next war. I don't anticipate <brain scan> studies will stop anytime soon. However, the next time you see a <brain scan>, ask yourself, who had to disappear to make this image persuasive?

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