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Brains with character: Reading and writing neuronarrative

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Chapter Three

Fear and Panic in Iowa City

In the spring of 2013, a group of researchers at the University of Iowa enthusiastically reported fear (Feinstein et al., “Fear and Panic”). Their joy stemmed from the unexpected occurrence of their research subject’s fear, for they gave fright to someone in the laboratory they had been trying to scare for over two decades, someone whom they believed was constitutionally fearless. The group, led by Justin Feinstein, upended decades of conviction about a part of the brain thought essential to the affective formula for humans experiencing fear and panic.

That part of the brain is the amygdala. A typical human has two amygdalae, each of which is a relatively small group of clustered neurons deep within each side of one’s temporal lobes. Suspicions about what operations the amygdala perform or mediate are widespread, and thus the research questions the amygdalae provide for neuroscientists are legion.¹⁵ Yet, the amygdalae studied in Iowa City for the past decades, for instance, by John Wemmie, Daniel Tranel, and Antonio Damasio, furnished the claim that an absence of amygdalae creates an absence of fear.¹⁶ The 2013 report overturns this rule.

At the center of the Iowa team’s 2013 report is Patient S.M. She has neither of her amygdalae. The 49 year-old mother of three—known as Patient S.M., and sometimes written up as SM-046—has been of neurological, neuroscientific, psychological, and experimental focus at the University of Iowa in some way since 1986 when she was 20 years old (Tranel and Hyman 350). She is diagnosed with Urbach-Wiethe, a genetic orphan disease with varied dermatological and/or neurological symptoms. In this instance, both of Patient S.M.’s amygdalae calcified, hardened, and eventually became lesions in her brain by the time she had finished her teens. Back in 1995, for example, Damasio, Tranel, and others

¹⁵ The amygdalae are recruited to project various explanations for human behavior. In addition to studies associating one or both of the amygdalae with emotions, fear, anxiety, or panic, R.J.R. Blair links a compromised amygdala function with psychopathy, for instance (2557), Dick Swaab believes volumetry and functional amygdala connectivity correlates with sexual orientation (10274), and Kevin Bickart et al. sustain that amygdala volume “correlates with the size and complexity of social networks in adult humans” (163).

¹⁶ A smaller Iowa team in 2011, also with Feinstein as the lead author, reported that “the human amygdala plays a pivotal role in triggering a state of fear and that the absence of such a state precludes the experience of fear itself” (“Human Amygdala” 34).

at Iowa continued to reaffirm that “SM-046 does not experience fear in a normal way, as we have found no convincing evidence that she feels frightened given the appropriate stimulus, and...she fails to exhibit the full range of psychophysiological responses to fear” (Adolphs et al. 5887). Just recently, in 2011, Justin Feinstein and colleagues subjected Patient S.M. to several affect-loaded environments: “an exotic pet store with snakes and spiders, walking through a haunted house, and watching film clips of scary movies” (Feinstein et al., “Human Amygdala” 34). Predictably, for the researchers, Patient S.M. experienced no fear. And while “nearly a century ago, it was discovered that CO₂ inhalation can trigger panic attacks,” this possibility was never attempted on individuals with amygdala lesions (Zieman et al., 1013). So, in the 2013 lab experiment, the Iowa team exposed Patient S.M. to 35% carbon dioxide gas, which, according to the report, “evoked” observable fear and panic (Feinstein et al., “Fear and Panic” 270). What I wish to question in this chapter are the ways scientific case studies themselves, alongside popular scientific and philosophical appropriations of scientific material, are determined by affective responses formed in relation to narrative.

Patient S.M.’s relation with scientific patient-characters demonstrates an extraordinary narrative cooperation between science and the humanities that, here, converge through the study of affect. Her particular brain, this chapter explores, acquires character not exclusively through technological precision or sober scrutiny in Iowa City, but by arousing allusions to historical accounts that stir affective investments in laboratory reports. I first follow the text of the Feinstein team’s 2013 report and consider the conventions of genre that frame it. The second section looks to the consequences of a narrative analysis of science writing for studies of affect theory in the humanities. This leads me, in the third section, to contemplate the history of patient-characters in scientific case studies as a practice of writing that enfolds cultural parables. Finally, I return to one famous neuroscientific case study in order to hear an echo of Patient S.M. and to demonstrate how narratives based around patient-characters determine both scientific agendas and conclusions, as well as their recirculation in critical-theoretical analyses in affect theory today.

Situated Sensations

Feinstein and the Iowa team were greatly surprised by the experiment and its results, but a casual reader might fail to sense that from the report eventually published in *Nature Neuroscience*. Entitled “Fear and Panic in Humans with Bilateral Amygdala Damage,” the

2013 report ostensibly observes just that, and overturns the amygdala-as-essential-for-fear precedent. But something was flattened between the Iowa team's reporting and its final publication. In the author manuscript, publicly accessible from the National Institutes of Health archive, the affective experience of the experiment on the scientists is still audible, but is silenced in the "final edited form."

"If there were any hint of qualia in a scientific report," says Nobel Prize-winning neuroscientist Gerald Edelman, "it would be edited out" (qtd. in Lodge 11). In fact, the author manuscript shares with readers how Patient S.M.'s fearful reaction to the carbon dioxide caused the authors to become so "surprised by this result" that they only then went on to test the setup on two others with bilateral amygdala damage (monozygotic twin sisters). The final publication reports only—in response to S.M.'s reaction—that the authors wished to "further explore this issue," as if already an element of the experiment's design. Initially, the experiment's affective incitement led the authors to characterize the laboratory situation by way of its "surprisingly" abrupt reversal of their steadfast hypothesis in the abstract of the report, but that sensation is simply stricken from the final abstract. "Even more strikingly, CO₂ triggered a panic attack in all three amygdala-lesion patients," write the authors when originally describing their core results. Yet, the *Nature Neuroscience* editors replace the sentence's subordinate clause with the more affectively depleted and austere "notably." The editorial decision to alter the Iowa scientists' first-person accounts—the qualia in their first-hand interpretations—exposes both the affective and narrative conventions undergirding S.M.'s cultural inscription in the report. Had the original manuscript been let to stand, a reader might have been alert to the affected sensitivities and proclivities of the researchers themselves as they attempted to accord what they witnessed in the experiment with narrative fashion and expectations for a larger public.

Considering this, I get the feeling that there were many different emotions and intensities in effect for all the players involved before, during, and after the experiment: anxiety, surprise, elation, fear, concern, distress, and accomplishment, amongst others. On the one hand, the scientific rigor, historical interest, and personal connection between the Iowa researchers and Patient S.M., if nothing else, testify to the powerful role that emotion plays in disciplinary practices of inquiry. On the other hand, the report satisfies the previously open conclusion of the lengthy tale of Patient S.M., and provides her ideal foil: not scared by

the exterior, affective world of snakes and spiders and scary movies, a gaseous cocktail inhaled in the space of a laboratory finally disarms her steeliness.

What most intrigues me in this scenario is not that the Iowa team's practices of science for the past twenty years were necessarily 'wrong,' but that their declaratory tales about the brain's mechanics of fear turned out to be. Now, in retrospect, their publications represent not a progression of facts culminating in a veridical outcome, but an ensemble of misreadings of the brain and misreadings of fear. This rerouting of affect matters. In the most recent narrative, S.M.'s story arc—her seemingly non- or extra-human fearlessness thwarted—legitimizes the Iowa group's neuroscientific work by penning a narrative resolution fit for widespread interest in media outlets, such as *The Guardian* (Costandi), the *New York Times* (Gorman), NPR (Zeilinski), and *Time* magazine (Szalavitz). One effect of negotiating all of the emotions and intensities involved is that it compels writers—scientists, journalists, and academics alike—to forage for a genre that situates S.M. within the sensibilities of our contemporary moment. Different communities make sense of the experiment in various ways. The Iowa Scientists, surprised by the need to exchange their paradigm of neural fear circuitry, reshape the archive of S.M.'s story as a historical misplacement, and write the 2013 report as a redemptive clerical gesture—she now belongs *here*, not *there*, with *these* understandings of fear and not *those*. Other media, coping with reporting the ambiguous character S.M., frame the Iowa laboratory as a space of relief, of neuroscientific resolution and clarification and of overcoming struggle.

“All genres are affective conventions that allow readers to expect to feel held by a world, even for a moment,” imparts Lauren Berlant (Berlant). I propose that reading the 2013 Iowa report in conversation with the concept of neuronarrative invites a productive analysis into both genre studies as well as the place and role of science in theorizations of affect. Amplifying the affective conventions “being absorbed and enjoyed” exposes the “implied affective and code-sharing” narrative worlds that something like a scientific report suggests (Berlant). A reading of the Iowa team's report allows one to hear the narrative in the neuroscientific research, an approach that disturbs the sense that the brain can only be announced, known, and heard in the technologized and biologized vernacular of science. It exposes the role of the scientist as storyteller, bringing its narrators within earshot of neuronarratives (or the “auditory grasp” of those mobilities and engendered effects of which Derrida speaks in “The Law of Genre”) (220). While the use of the term neuronarrative

might describe a type of storytelling that advantages neurobiology when explaining setting, action, plot, or characters, that limited use misses the genus of writing where neurobiology itself becomes characterized: laboratory write-ups that depend upon the use of patients as emotive organisms that orient neuroscience explanations. Here, the patient S.M. intertwines with the narrative quest to solve the riddle of the Iowa team's protagonist S.M.; this entanglement determines the science that scientists translate into publications. As I analyze later, the history of using stories of patient-characters frames the very parts patients play in writing science.

Thus, while one might protest that the report is not, on its face, embraced within the possible genre of neuronarrative, for that exact reason, it partakes in it: "a sort of participation without belonging," interjects Derrida (224). It makes use of the genre for explanatory purchase. Indeed, the report does important cultural work, not just biologically, but narratively: first, it allows an established (physiological and discursive) neural network to dissolve by un-thinking particular assumptions of cognitive connections and patterns (the amygdala is no longer imaginable as the gateway of fear), and second, it re-envisages Patient S.M. to articulate a tale different from an allegory of fearlessness (the "inhaled CO₂ activated a pathway that had remained mostly dormant up until the point of the experiment," hints Feinstein et al.) ("Fear and Panic" 272). Listening for the affects convened, recruited, and satisfied in the report throws up questions about the ways by which narrative conventions and affective conventions provide a horizon for the limits of neuroscientific investigation. The intervention this chapter proposes, therefore, is not about case studies as pedagogy per se, but about the role of the case who—not *that*—the Iowa team both study and story.

"She Is Not Emotionless, But Rather Fearless"

The takeaway lesson for the Iowa team in the 2013 report is that, "Contrary to our hypothesis, and adding an important clarification to the widely held belief that the amygdala is essential for fear, these results indicate that the amygdala is not required for fear and panic evoked by CO₂ inhalation" ("Fear and Panic" 272). The experiment seems to expose a way to outsmart a particular ideological pathology. For neuroscientists in general, the results problematize claims of a localizable fear mechanism in the brain. That is, it questions the idea that fear could have a universal cranial postcode. With regard to the affects involved, neuroscientist Joseph LeDoux takes umbrage with the Feinstein team's interchangeable use

of the term ‘fear’ “to describe both feelings and brain/bodily responses elicited by threats” (156). For LeDoux, this move represents an uncritical interpretation and deployment of the concept of fear, because the “language implies that the defense mechanisms go hand in hand with the feeling of fear” (156).¹⁷

This particular dispute—whether or not circulating affects register through conscious awareness or unconscious reflex (or, in Feinstein’s language, those “afferent sensory pathways that project” onto brain parts)—plays into the familiar debates on intentionality that both Ruth Leys and Grant Bollmer, for instance, identify in their exposés of affect studies in the humanities (“Fear and Panic” 272). Ruth Leys, professor at Johns Hopkins and author of *Trauma: A Genealogy*, publishes extensively on the appeal and study of affect in the humanities and the sciences, and is critical of the urge (coming particularly from Brian Massumi and William Connolly) to naturalize politics and culture by linking them to the materialisms of the (neuro)sciences. For Leys, “what fundamentally binds the new affect theorists and the neuroscientists is their *shared anti-intentionalism*,” which is “the belief that affect is independent of signification and meaning” and therefore renders affect “a matter of autonomic responses that are held to occur below the threshold of consciousness and cognition and to be rooted in the body” (“Turn” 443). She observes a false binary between mind and matter in this ideology, one that demands that “the way to understand fear or joy is that they are ‘triggered’ by various objects, but the latter are nothing more than tripwires for an in-built behavioral-psychological response” (438). Neurobiology, in the accounts she criticizes, operates beyond and prior to consciousness and the realm of discourse.

Grant Bollmer examines the historical and cultural production of affective and non-affective bodies as part of a larger interest in networks and power at the intersection of biology and technology. Bollmer also scratches his head at affect theorists in the humanities who, for him, seem to evacuate any hermeneutic or phenomenological political possibility in the political project of cultural studies when they embrace anti-intentional ontologies of affect (318). Taking into account Leys’s critique, Bollmer proposes that affect “may have intentional

¹⁷ LeDoux’s writing over the course of his career takes certain care to sequester the study of “fear” from the study of “threats.” LeDoux encourages distinguishing processes that give rise to conscious feelings of “fear” from non-conscious neural automations that respond to “threats.” Where LeDoux and the Feinstein team overlap, however, is a working assumption that neural architecture maintains a one-to-one ratio with the particular vocabulary used to describe it.

or non-intentional aspects; it may be articulated to systems of signification or it may not” (318). He observes: “Affect, in the neuropsychological form appropriated by affect theory, is mobilized not to celebrate some wild free potentiality of the body. Affect is invoked to make the body speak in a way that interpretation and language matter not and materiality—as revealed through medical imaging technologies—yields truth” (311-12). One antidote for the project of what to do with theorizations of affect and theorizations of neurobiology, for Bollmer, is to read those mobilizations and invocations: to understand “how affect is employed” to unite or divide bodies, materials, or discourses “without assuming material, biological force of ‘relation’” that miraculously appears from a non-cultural or pre-cultural conceptualization of nature (318).

Biological pathology is another dispute in affect studies the Iowa team’s report engages. The team’s protracted interest in the link between amygdalae and fear has to do with “S.M.’s abnormality” (Feinstein et al., “Human Amygdala” 36). That is, for Feinstein et al., S.M. is brain-damaged, and experiences a deficit of fear where fear ought typically to occur. She is a “unique case” of brain disorder (37), “immersed in a secure Pollyanna world” (Damasio qtd. in Leys, “How Did” 86). But these normative portrayals instill an unease in me with the ways patient-characters in affect theory are pathologized into character types. From Parkinson’s sufferers to schizophrenics, autistics, epileptics, and, here, the fearless (via a degenerative brain disorder like Urbach-Wiethe), Catherine “Malabou claims that the uniting feature of all of these conditions is an absence of affect, ‘an emotional deficit’, that emerges from the neurocognitive materiality of the brain” (Bollmer 307). Malabou brings questions of phenomenology and materialism through the lens of neuroplasticity to the study of affect. For Malabou “brain damage” always “interrupts the economy of our affects” (“Go” 58). The result of brain lesions “is the formation of ‘someone else,’ a new self, a self that is not able to recognize itself,” since the accident “erases *any* trace and *every* memory, and that destroys *any* archive” (58). “Such a subjectivity,” she adds, “is absent to itself and to its essence as well as to its accidents—a subjectivity *without* affects” (58). And yet, “To say that SM is emotionless or unable to feel emotion is simply false,” the Iowa team pre-empt (Feinstein et al., “Human Amygdala” 37). “She is not emotionless, but merely fearless,” nuances neurobiologist Dario Dieguez. Thus, what to do about how, on the one hand, Bollmer calls out Malabou’s ordering of S.M. as an affectless case within her genre of “the new wounded,” and how, on the other hand, S.M. persists in being affective and affected by ambiguous

understandings of those concepts (and since 2013, as well, with fear it would seem) (307)? Neither version is truly appealing to me, for both co-opt the productive problem of affect as ammunition for disciplinary turf wars. At this point, I am not interested in offering a neurological methodology or an ontology of affect; rather, I want to invite a theorization of narrative to determine the ways cultural objects productively problematize rather than illustrate those existing ideological frameworks.

The seduction, I fear, for cultural critics of affect studies, is that an object like the Feinstein study is recruited to service a wider ontological argument. Constantina Papoulias and Felicity Callard, for instance, investigate the recently fashionable interest in affect in the humanities. They discover that “the turn to affect in cultural theory” is “accompanied by a dependency on particular citations from neuroscientific and developmental psychology literature” (“Biology’s Gift” 31). In fact, like Leys points to Eve Sedgwick, Papoulias and Callard find work that imports neuroscience into ontologies of affect as “emblematic” in current affect studies and “indicative of an increasingly common position taken by cultural and social theorists” (Leys, “Turn” 246, 247). What I wish to avert is to position the Feinstein study as exemplary or emblematic of a particular theoretical argument, to risk flattening the object into ‘just an example’ of a grander theory or theorization rather than reading the study as an object on its own terms. This point of departure more closely aligns with an investigation into how, within “cultural theory’s narratives, by contrast, affectivity becomes a placeholder for the inherent dynamism and mutability of matter,” that Papoulias and Callard observe (“Biology’s Gift” 29).

On its face, the Feinstein study exposes a previous ignorance. But it also describes how it is possible to expose someone to fear and panic. That is, even if one naïvely understands carbon dioxide as affective—that it is literally in the air—then one can think about the circulation of affects as a type of exposure. Exposure, in this case, defines how the version of fear offered functions, and that is achieved through narrative exposition particular to the literacies required for its readability.

Mieke Bal, in her work *Double Exposures*, suggests that the triple meaning of the verb ‘to expose’—exposition, exposé, exposure—constitutes the field of cultural analysis, for it “defines cultural behavior if not ‘culture’ as such” (5). The verb refers to “the action of ‘making a public presentation,’” where the exposure involved “is an act of producing meaning” (2). Exposure acquires intelligibility, therefore, in exposition, in the public telling and sharing

and reproduction of ideas. Jonathan Culler contextualizes this practice in describing how “stories...are the main way we make sense of things, whether in thinking of our lives as a progression leading somewhere or in telling ourselves what is happening in the world” (82). Extending this departure, Giorgio Agamben includes writing and technologies of storytelling as Foucauldian apparatuses connected with power, those things that have “in some way the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, disciplines, judicial measures, and so forth” in cultural negotiations (14).

Therefore, I approach the 2013 Feinstein report on its own terms, as my interlocutor in a conversation about fear and affect before interpreting its implications for the neuroscience of fear and affect studies. This nexus of narrativity, power, and articulation ushered through exposure cues my analysis of the peculiar narrative politics densely texturing the object. Here, I want to press that a neuroscientific explanation engages the logic of storytelling: to understand fear and its operations is to grasp a narrative showing how one affect leads to another, and how one affect can overcome something else to produce a similar exposure (i.e., activating “a pathway that had remained mostly dormant up until the point of the experiment”) (Feinstein et al., “Fear and Panic” 272). The concept of fear is at play in the Feinstein study, and the plot of fear is what narratives shape.

In the next section, I look at the ways the Iowa team’s textual crafting of Patient S.M. quotes character-based case studies from medical literature within a history of ideas. The concluding section argues that the specific citations embedded in the report are freighted by a politics of storycraft, which exposes the narrative entanglements that cultural critics of affect studies *and* neuroscience researchers perform.

Quoting Cultural Anxieties

First, a little storytelling about neurobiological stories. Just outside Cavendish, Vermont in the summer of 1848, a man named Phineas Gage prepared a bed for the Rutland and Burlington Railroad by placing explosive powder into holes drilled into rock. Gage used a tamping iron to pack the explosives, and at one point in the late afternoon, as a result of accidental explosion, the roughly meter-long iron blew completely through his head. It entered through his face under the left cheekbone, exited the top of his skull, and landed some twenty-five meters behind him (Macmillan 47). Gage survived that day, and continued to live for another eleven and a half years before dying of epilepsy in San Francisco.

The accident obviously left a severe lesion in Gage's brain. Psychological changes are reported to have occurred as a result. The physician who treated Gage in Cavendish wrote some twenty years after the accident, that Gage's "mind was radically changed, so decidedly that his friends and acquaintances said he was 'no longer Gage'" (Harlow qtd. in Macmillan 65). In concurrence with a progressive history of neuroscience, interest in Patient S.M. was part of an interest in studying a damaged brain (or deceased brain) for its insights into how the healthy brain functions.¹⁸ Gage's situation became popular for didactic purposes. Thus, in his afterlife, Phineas Gage enjoys a long history of appropriation. Stories of Gage have been taken up as a morality tale of alcoholism, associated with yarns about a carnival freak show, contained in medical illustrations, featured as an anthropological object tutorial, and utilized as union worker story, to name just a few. In 2000, Malcolm Macmillan took up the uses and abuses of Phineas Gage stories as an object of cultural study in its own right. He found that Gage "appears in nearly sixty percent of the introductory textbooks of psychology" published between 1983 and 1998 (Macmillan 47). Each publication does not recount the same story, however; each appearance becomes an instance of cultural (and scientific) memory for a particular present to carry a particular message. Science resources the patient-character Gage as needed to warrant and texture wildly varying conclusions, and figures of Gage therefore operate from a reservoir of imaginative explanations.

Second, consider similar reverberations of literary influence in scientific agenda setting. Rodrigo Quian Quiroga, a neuroscience researcher and reader in bioengineering at the University of Leicester, published *Borges and Memory* in 2012, which is a reflexive text that chronicles the way the work of twentieth-century Argentinian writer Jorge Louis Borges explicitly motivated Quiroga's scientific agenda, investigations, and conclusions about the brain ("Borges"). "I discovered Borges as a teenager and was fascinated by the mathematical precision with which he describes what defies every logic," writes Quiroga, adding how, "I rediscovered a story of his, 'Funes the Memorious,' ... which with astonishing clarity ended up sorting the pieces of the [research] puzzle I had been working on" (*Borges* 5). Quiroga cautions that he is "not trying to force a link or suggest that Borges foresaw modern

¹⁸ This linear history draws a line from the study of anatomy through nineteenth-century neurologists, such as Paul Broca (who, in observation of the speech-impaired 'Patient Tan,' discovered the brain area regulating speech production named after him) or Carl Wernicke (who, studying brain-damage in patients, localized aphasia in a brain area also named after him).

neuroscience,” yet admits how “Borges is perhaps the catalyst that persuaded me to tell a story” about “Funes’s roots and his relation to the principles of neuroscience” (*Borges* 7, 8).

In this way, narratives—and adolescent stories explaining later interests—frame disparate elements, stray observations of scientific subjects, as well as motivate the questions by which one approaches their scientific pursuits. Narrative fiction operates as a conversational partner for neuroscience: “Borges gave me a much-needed chance to take a pause and to think in depth and debate (in my mind) with Descartes, Bishop Berkeley, and [William] James,” writes Quiroga; “How misguided we scientists are when we think we are the first to deal with the big questions!” (*Borges* 7). Quiroga emphasizes the conversational, affective space that fiction invites for his neuroscientific analysis when he claims how “having these imaginary discussions with Borges and following his thoughts and his readings gave me the break I had long needed to step aside for a while and see things in perspective” (*Borges* 207). Here, narrative fiction and narrative characters serve to anchor, unclutter, and tidy disparate science.

Third, consider the intertextual and cultural influences of patient-characters. In March 2011 in *Harper’s* magazine’s “Readings” (a section regularly featuring a diverse collection of reprints of interesting documents and artworks), three paragraphs from Feinstein et al.’s 2011 *Current Biology* report (describing a fieldtrip S.M. took with Feinstein to a haunted house as part of the snakes and spiders episode) appear under the heading “The Woman Who Felt No Fear.” The verbatim reappearance of the text into a literary frame exposes a neuronarrative architecture entangled with the curious and storied life of this patient-character. Even Quiroga (like the writers and scientists who use Gage), in his pausing to rethink neuroscience through Borges’s fictional character Funes, cannot help but resource the reservoir of other neuroscientific characters in order to share his research and make it audible to contemporary ears. Quiroga’s book recalls how, in 1953, neurosurgeon William Scoville removed both the right and the left hippocampus from the severely epileptic twenty-seven year-old Henry Molaison’s brain. “The surgery, which indeed managed to stop his seizures,” details Quiroga, “radically changed the history of neuroscience and our knowledge of memory, but unfortunately transformed Henry Molaison into Patient H.M. forever” (*Borges* 52). Scoville’s procedure left him with a bilateral hippocampal lesion, and therefore “H.M. was incapable of forming new memories, a condition known as anterograde amnesia” (*Borges* 52-53). He could remember things and events from before the surgery, but

was unable to generate new memories, like the meaning of new words, or his new postal address after moving house, or that he had just eaten lunch. Patient H.M. became a hit for researchers of all types, and the several hundred articles relating to studies of him—which, like the Iowa team with S.M., were mainly conducted by a few key people—are widely cited and circulated today (*Borges* 64).

I recount the three nested stories above to call attention to their significance for the crafting of our contemporary. Like Phineas Gage and Patient H.M., Patient S.M. stars in contemporary scientific pedagogy. She, as with her medical-historical male counterparts, enjoys similar appropriations of her story and studies about her in an effort to ascertain, deal with, and manage contemporary problems. Several recent 101-level psychology textbooks employ her as a character device to witness evidence of the amygdala's role in emotion.¹⁹ I will volunteer one instance to demonstrate the conclusion I take from it. In one book, the story of Patient S.M. appears in a pull-quote bubble entitled “Neuroscience Applies to Your World: Is Fear Good For Us?” The excerpt teaches students how “On the surface, you might think that living a fear-free life might be great, but a closer look at S.M. shows the darker side of fearlessness” (Pastorino and Doyle-Portillo 60). The bubble story goes on to briefly report how, one evening, Patient S.M. could not be bothered when held at knifepoint in an Iowa car park. In light of the legend here shared, I have to smirk, recalling Starbuck aboard the *Pequod* when he implies to the crew that “an utterly fearless man is a far more dangerous comrade than a coward” (Melville 111). That narrator positions a lack of respect for the white whale—for what is dangerous—as nothing short of foolish. The psychology textbook would seem to enable and sustain that politics of foolishness. While I pause at a tale here about the consequences of having superhuman abilities, what is interesting is that the 2011 Feinstein study—the one with snakes and scary films—reported this attempted knifing episode as an anecdotal aside. The Iowa team were certainly not present collecting data when this occurred to Patient S.M., but they felt this self-reported memoir important enough to further evidence their findings about the amygdala.

As it happens, the authors—that is, the “we” who narrate the 2013 Feinstein report—internally focalize the story's action by way of observing “self-reported levels of fear and

¹⁹ For examples, see Rod Plotnik and Haig Kouyoumdjian's textbook (362), Ellen Pastorino and Susann Doyle-Portillo's *What is Psychology?* (60), and Kenneth Carter and Colleen Seifert's *Learn Psychology* (429).

panic,” “anecdotal accounts,” and what “the patients reported” (Feinstein et al., “Fear and Panic” 270-71). Although the report’s story strives to incorporate three biomarkers (respiratory rate, heart rate, and skin conductance), the supplemental denouement describing the study’s methods note that most of the biomarker data for S.M. and the other two amygdala-damaged subjects was unrecordable or corrupted, and that the researchers in fact went to great lengths to inductively include publishable graphs and charts. The researchers themselves chronicle the climactic moment—Patient S.M.’s response to the CO₂—as “gasping for air, [showing] distressed facial expressions,” and displaying “escape behavior (for example, ripping off the inhalation mask)” (271). In other words, what provides the 2013 report’s thrust is not a summarizing of data, but a first-hand account of the “feelings induced by the CO₂,” the “emotional changes” experienced, and the reactions S.M. expressed in that laboratory room in Iowa City (270-71). Here, only narration exposes fear. It is in these stories in which the fearful, panicky events can ultimately *be* exposed.

While S.M. may indeed be an exceptional person, the inscription of the exceptional person is a tradition in science that both precedes and determines the conditions of her narrative. The argument here is that the quotation of character sketches, whether through Phineas Gage, H.M., or Patient S.M., enfolds and condenses cultural parables. The 2013 Feinstein is an exposé of the amygdala, but it is not *only* that: it engenders a crafting of medical pedagogy, patient-characters, psychology fashion, thriller anecdotes, and journalism in its inscription. That is, in declining affect as a stable, independent, and quantifiable variable, hearing the narrativity involved exhibits an arc of affectivity that interrupts, shapes, and instigates scientific inquiry. As Bollmer observes, “If we start from the position of history, refusing to accept affect as an eternal, transcendent guide for cultural politics, we can observe that there are categories produced by psychology, with reference to the brain, made visible with medical imaging technologies, which serve to marginalize and exclude specific bodies from humanity” (321). What is exposed in this regard is that “specific bodies are placed into apparatuses”—narrative apparatuses in the register of Agamben, I argue—that inscribe “contingently produced ways of dividing and shaping possibilities for bodies and political agency” (322). Political formulations are organized *through* affect, in relationships that have more to do with feelings, anxieties, and desires than an autonomous, impartial rational thought often coded and read as a ‘scientific report.’

The Laboratory as Literary Space

In this final section, I want to press Malcolm Macmillan's study of Phineas Gage as a way to return to scholarship on affect by thinking about the scene, or event, of affective relationality as fractured and multiply temporal.

Only a few primary documents exist of the Gage case, but "the only picture of Gage that we have" comes from the reports of John Harlow the physician who treated Gage in Cavendish and Henry Bigelow, a Harvard professor and surgeon who reported the case (Macmillan 47). To Macmillan's dismay, "much of what is contained" in the contemporary textbooks featuring Gage "is strikingly at variance with" the few extant primary documents (47). Of the five dozen or so books to which Macmillan looks, he reserves space in several places for an analysis of Antonio Damasio's book *Descartes' Error: Emotion, Reason, and the Human Brain*. Here, it ought to be noted that Damasio, until 2005, was professor and head of neurology at the University of Iowa and co-authored many of the publications on Patient S.M. out of that University's research team. Macmillan cites Damasio's book as one of several dozen "erroneous accounts" of Gage that demonstrate "an ignorance of what ... our primary sources say about circumstances of the accident" (49).

First, Macmillan observes that "The Gage of fable" narrated by Damasio has it "that [Gage] 'never returned to a fully independent existence,'" whereas no evidence exists to warrant that assertion (55). In fact, Gage went on to work as a stagecoach driver in Chile for seven years, where "he [and his mental faculties] would have had to adapt to the challenges of the routes travelled while at the same time dealing politely with passengers' demands" (Macmillan and Lena 644). Macmillan adds, "It seems unlikely that a Phineas still disinhibited by his accident would have qualified" (644).

Second, Damasio distorts Gage's post-accident engagement with friends and family to the point that "as A.R. Damasio has it," writes Macmillan, "Gage virtually became a psychopathic personality who lied and could not be trusted to honour his commitments" (Macmillan 54). This is at odds with Harlow's report in 1868 that describes how Gage "was accustomed to entertain his little nephews and nieces with the most fabulous recitals of his wonderful feats," and another report of Gage performing various kinds of farm work up until the day he collapsed (Harlow qtd. in Macmillan 66).

Third, Gage's "supposed ... lack of concern for matters he had formerly cared about ... and his showing little emotion, losing his former values, and becoming unreliable in his

personal habits,” Macmillan writes, “almost certainly seep in” as characteristics “from the brain surgery and psychosurgery literature” of the twentieth century (Macmillan 58). Macmillan, here, exposes a discursive feedback, where scientific investigations reported and written about in the 1930s and 1960s became (anachronistically) rewritten into Gage’s nineteenth-century circumstances, and, in the present, now become the source material for further narratives in neuroscience.

Lastly, Damasio’s retelling of Gage as a “degenerated character” with an affective deficit is an ideological commitment made clear in his book’s agenda (12). His “message” in Gage’s case is “that observing social convention, behaving ethically, and making decisions advantageous to one’s survival and progress require knowledge of rules and strategies *and* the integrity of specific brain systems” (17). Grant Bollmer identifies this rhetoric as one that recuperates vitalism in studies of affect. The discourse frames individuals *as* their neurobiology—the killer, the addict, the deviant, the wounded—through which normalcy is maintained in its difference. Here, parables of lessons-learned help neural lesions supplant psychology when ordering humans.

Thusly historicized, Gage is made utterly contemporary and conversational with S.M. Indeed, Damasio himself explicitly connects the affective deficiencies of Patient S.M. and Phineas Gage in that book *Descartes’ Error*. He introduces S.M. not by her pseudonym, but as “a woman with a lifelong pattern of personal and social inadequacy” and who “has little concern for the problematic situations into which she gets herself” (69). “The ‘folly’ of her behavior,” writes Damasio, “is not unlike that found in Phineas Gage” and “cannot be blamed on poor education or low intelligence” (69). When one takes into consideration the corollary write-ups of Patient S.M., which describe her as one whose “social behavior remains relatively intact ... is married, raising children and is able to hold down a job... [and] is able to carry out a fairly normal social life ... [without] any impairment in reciprocal social interaction,” Damasio’s caricature seems not just more fabulous, but entirely devoted to shoehorning S.M. into his own favored diagnostic pattern, where broken brains equal broken affects; specifically, a broken amygdala translates to a broken or missing fear response (Amaral et al. 299). The thicket of stories that both give occasion to a patient-character like S.M. and that specifically capture, regulate, and orient Patient S.M. in the literature exposes the layered narrative operations that guide its reading.

Writing in 2013, Malabou, when inquiring into the destructive work of neural and psychic disconnection, invokes “the famous case of Phineas Gage, which is related by Damasio in *Descartes’ Error*” (Malabou, “Go” 57). The event of the accident is “purely contingent, external, and totally unanticipated,” in her reading of Damasio’s version of Gage, and “cannot be assimilated or interiorized by the psyche or by the brain”; somewhat predictably, given Malabou’s storied source, the cerebral event “is not a partial modification but a complete metamorphosis of the personality” (57). As noted earlier, the lesson Malabou takes from Damasio’s parable of Gage is that “brain damage” always “interrupts the economy of our affects” (58). To buttress her interpretation of Damasio’s story, and to nourish her conclusion that “All the cases of brain damage Damasio exposes are cases of absent subjectivity. ...a subjectivity *without affects*” (58), she flips back to “*Descartes’ Error*, in chapter 3, ‘A Modern Phineas Gage.’ This modern Phineas Gage is named Elliot” (59). The story—or Malabou’s retelling of Damasio’s retelling—is that Elliot had a brain tumor removed and therefore “Elliot was no longer Elliot,” according to Damasio-via-Malabou (59). The intertextual reference to Harlow’s phrasing that ‘Gage was no longer Gage’ is not innocuous. It demonstrates a contiguity of narratives that converge on an ability to recruit medical characters in the service of narrating coherent ontologies of the affective subject, and to support the ideology that “the ‘absence’ of affect is assumed to indicate a reduced capacity of the body to experience a natural, vital force essential for the lived embodiment of the biological organism” (Bollmer 308).

I expose Damasio’s work in this chapter not for purposes of culpability, but to complicate a story about fear from Iowa City that, on its face, would seem coherent and whole. Damasio’s writing, as a direct result of the extended experiments he and his colleagues at the University of Iowa perform on Patient S.M., speaks to the way power becomes focalized through narrative characters in multiple frames of reference at various times. From this perspective, the 2013 Feinstein report can be read not as an instance or example of the neuronarrative genre but as a use of it: an allusion to the conventions that shape it, which allows us to feel held by its world. Among the questions this reading forces me to ask is how a text generates a much larger structure of meaning that is not contained or constrained by what the text explicitly says. Stories—here, the affective ones in science—depend on other stories for coherence and intelligibility, and therefore determine affective responses formed in

relation to narrative. Further, when Emily Martin appraises the motivation and potential resourcefulness of affect studies in the humanities via neurobiology, she proposes that

the affect/intentionality system is a set of arrangements by which a society transforms neurological processes into products of human activity. Affects are a social effect rather than the result of human biology. Intentions in this regard are conceived as the remainder—the material brain and those neurological interactions that are necessary to reproduce it. Looked at this way, what we see as the affects are the product of a social process that has separated them from larger contexts rather than a new entity we have discovered in nature. (S156)

Here, she suggests a resonance of practices between the neuroscientific laboratory and critical theory in the humanities, and a possible antidote to both analytics' moving away from the social, culture textures that prompt inquiry in each. That affects are better understood as a “product of social processes” that include narrative demonstrates how questions through the frame of neuronarrative make audible a concern for what kind of world is summoned into being through intertextual affective scientific writing.

Felicity Callard and Constantina Papoulias are thrilled to point out that humanities scholars like William Connolly, Andrew Ross, Nigel Thrift, Eric Shouse, and Elizabeth Wilson all cite Antonio Damasio to buttress their own theorizations of affect (“Biology’s Gift” 52). The stakes, as they see it, are that the humanities write their stories of affect by quoting the neurosciences. As I demonstrate, however, the trafficking of ideas—and characters—is a bit more complex, involving the politics of history, a history of political and social anxieties over what it means to feel human, as well as how best to express that. Excavating the exposition published by Feinstein and his colleagues demonstrates that even neuroscience’s citationality struggles to account for the arc of its own narration. Here, what is seen and described as fear in Feinstein’s report turns out to be a caricature of fear that only arrives by traveling through anatomical expectations, the literary laboratory, mediated medical recollections, thriller scenarios, and displaced scientific observations. Thus, my reading of the positioning of affect in that report shows that the neurosciences and the humanities both invite and decline certain narratives to structure the very research agendas and questions they each pursue. It exposes the powerful work that certain available narrative plots do in various practices of inquiry on their quests for capturing, understanding, and theorizing affects.

This entanglement demonstrates how the report implicates an understanding of our contemporary through a history of the present. It also demonstrates the literary cooperation aroused in science and the humanities as scholars in each narrative domain characterize each another's brains when those brains are taken up as objects of analysis. I underscore the anxieties—dare I say fears—over how certain accounts of affect participate in culture: as fable, as evidence, as intellectual capital, as characterization, as discipline, and as ideological duties that narratively prompt both theorizations *and* experimental accounts of affect.