

## The Storytelling Brain

### Commentary on “On Social Attribution: Implications of Recent Cognitive Neuroscience Research for Race, Law, and Politics”

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**Abstract** The well-established techniques of the professional storyteller not only have the potential to model complex “truth” but also to dig deeply into that complexity, thereby perhaps getting closer to that truth. This applies not only to fiction, but also to medicine and even science. Compelling storytelling ability may have conferred an evolutionary survival advantage and, if so, is likely represented in the neural circuitry of the human brain. Functional imaging will likely point to a neuroanatomical basis for compelling storytelling ability; this will presumably reflect underlying cellular and molecular mechanisms.

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In a world of infinite possibilities, the human mind requires a set of heuristics to function in a changing environment and dynamic culture. It needs a strategy to bound itself, as economists might say. The functions in question relate to social interaction, to communicate something considerably more complex than “predator here” or “prey there” or “let’s build a new beehive out yonder” (yet nonetheless potentially bearing on these kinds of basic survival issues): exchange of goods and favors, moral judgments, causal explanations of the vicissitudes of life as well as the behavior of other group members and outsiders, individual and group planning, teaching the basics to the young, passing on folk wisdom to teens with short

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attention spans as well as young adults with mountains to climb, and so on (in other words, the wisdom of the *Iliad* and the *Odyssey*, the *Mahabharata* and the *Ramayana*).

What is the minimal mental toolbox that might allow all this? It seems that the capacity to tell compelling stories orbits near the center of it. Storytelling has tremendous flexibility. It is often said that a fairly small number of stock characters and stock plots are sufficient to address, to a first approximation, many of the kinds of situations mentioned above, especially in the presence of other sensory clues. If all that survived of civilization were comic books from a few parts of the world, beings in the future might have a half-reasonable sense of the human condition, particularly if the special powers of superheroes were discounted (or interpreted as sublimations or wishful thinking). Further, those stock stories can, with modifiers, easily be made to incorporate the humanity of individuals, their feelings, their pasts, all sorts of contextual cues.

Straddling the roles of physician-scientist and sometimes novelist, I cautiously argue that effective storytelling can get at complex truth. One question raised by Darren Schreiber (2012) in his article “On Social Attribution: Implications of Recent Cognitive Neuroscience Research for Race, Law, and Politics” bears on whether current brain imaging techniques are sufficiently advanced to make inferences about an individual’s intentions in legally relevant situations. Understanding this could potentially impact the extent to which an individual is deemed culpable or not. Is there truth in the story, and if so, how much?

To me, the problem seems a little like the distinction E. M. Forster (1927) drew between “story”, a sequence of events, and “plot” which implies a causal explanation based on specific circumstances and the intentions of characters. Making the plot more “believable” is, of course, something most novelists struggle with a great deal, and it often determines the critical reception of the novel. Just as in legal and political settings, it is about choosing words and crafting sentences.

Consider the following sentences.

1. The man bit.
2. The charmer bit.
3. The charmer bit the snake.
4. Enraged by being bitten by his own cobra, the charmer grabbed the snake at both ends, lifted it up, and bit it in half.

There are many potential variations of these sentences (several others are explored in *The Snake Charmer* [Nigam 1998]), but the point is that they are likely to have different impacts on the same person. Moreover, different people are likely to respond differently to any one of the sentences—depending on how they feel about, among other things, snakes, charmers, a certain prose style and physical plausibility (conventional versus magic realist fiction).

Can brain imaging sort out these various kinds of responses? If so, it will begin to say a lot about the similarities and differences between “fictional truth” and “non-fictional truth.” It will begin to clarify the many gray zones that constitute most of normal human communication—the stories people tell each other (and themselves).

Despite a century of modernist and postmodern musings, the basic ways of storytelling seem to have survived. Fiction, literary and non, that is penned by

novelists and short story writers still seems to rely in large part on notions emphasized by Aristotle as well as those noted by later critics to be essential features in folk tales and myth. The same with movies and theater. For that is what audiences, low brow and high, keep wanting—as indicated by best seller lists and box office receipts. Experimentation continues in phenomenally interesting ways, but it tends to be most appreciated by an elite crowd.

It remains surprising to me how readily Aristotelian and other traditional criticism can be applied not just to Sophocles' tragedies but also to Gilgamesh and stories embedded within the Indian epics. This suggests (as those who study myth have often said) that these ancient stories capture something basic about human culture and perhaps even the human mind. Could concepts like plot and character have neural correlates? One might argue that these, and storytelling itself, are an emergent property of the conscious mind. Maybe so. But perhaps one can get a finer view, identifying subsystems. Certain evolutionary psychologists like to talk about modules in the human mind, and it has been suggested that these might number in the thousands. Could the basic elements of a compelling story correspond to the hard wiring of certain combinations of these modules? Could, say, modules 12, 79, 348, 931 and 1,599 correspond to a capacity to tell a story with a believable plot? Does a certain weighting in these connections or a more stable linkage to module 765 make it more compelling? Is there a separate plot module? One wonders if a well-designed set of functional brain imaging studies could shed light on this. Maybe such studies are already underway.

Inevitably one must also ask if there is a network of genes responsible for the capacity to tell stories. What are the key neuroanatomical structures, the cells, the molecules? Any explanation must account for the nuances that make one story more successful than another for the purpose at hand. This capacity will vary among individuals and be subject to evolutionary selection pressure—for it seems a huge advantage to the group if leaders and grandmothers are good storytellers. Storytelling capacity will hopefully eventually be reflected in the biological understanding at all levels of the “system.” That will go a long way to providing a “hard scientific” picture of how the human brain is able to make sense of the universe and itself.

A compelling storyteller would seem to have a survival advantage. Just as now, in a market place full of narratives and with the possibility of generating an infinite number through novel permutations and combinations, the better storyteller is likely to out-compete poorer storytellers for resources. Better storytellers are likely to be better planners, judges and so on, and their flexibility in framing the story in new contexts and settings would probably be highly adaptive. To the extent that prestige (if not some sort of leadership) depended more on this kind of brain than brawn, these people would survive and they would be more likely to reproduce—and to keep their offspring around. The genes that cause certain combinations of modules to develop, or affect their connections, resulting in better storytellers, would pass on.

To get back to “truth” in science, medicine and fictional texts, with lots of qualifications, I am more inclined to a postmodern view than many scientists. There is experimental truth, theoretical truth, symbolic logical truth, pragmatic truth, mathematical truth, statistical truth, clinical truth (i.e. “In my many years of

practice, this tincture works most of the time—don't ask me why or how, or what's in it—but come back if you don't feel better so we can try something else”), philosophical truth, religious truth and so forth. All are not equal or applicable in every situation. Methods of arriving at syllogistic truth, for example, have limited applicability in the experimental lab or the clinic or in an argument with teenagers. Metaphysical truth is hard to substantiate independently.

And there is fictional truth. How true is Leo Tolstoy's *The Death of Ivan Ilych* (1886)? Is it not surprising how much truth, in spite of knowing of no firm evidence for it, there is in that novella? One understands the man's suffering and his loneliness. A doctor should read such a story—either this book or a similar one—every 5 years. The same story, over and over. That doctor will not only understand much about his or her patients' suffering but about himself or herself as a physician and a person.

Fictional truth is, more obviously than in the other kinds of truth, the result of compelling storytelling. What makes a story compelling? This could be of paramount importance in understanding the evolution of the human mind. Of course, writers have pondered the issue of what makes a story compelling, but this is not the place for a discussion of the tricks of creative writing. The point is that “compelling” from a writer's perspective has a lot to do with “truth,” much the same way that mathematicians and theoretical physicists often argue that the more “beautiful” equation among many possible ones is the “truer” equation. And there are a number of instances where this aesthetic sense, whatever it is in terms of a set of criteria, has been stunningly ratified in the real world of particle accelerators and sophisticated telescopes. (Still, those capable of writing the most compelling stories and most beautiful equations sometimes make questionable aesthetic decisions; there is the matter of an insipid story or two by Chekov and a great physicist's doubts, ostensibly aesthetic, about the cosmological constant.)

What does all this have to do with ethics? A lot, it would seem (Charon 2006, Cousins 1982). For example, the types of complicated ethical problems that a doctor faces in an intensive care unit, or in a neurology practice with many Alzheimer's patients, or in a hospice situation, require, fundamentally, that one understand the patient's story in as nuanced a manner as possible. At the same time, stock responses to stock stories are, fortunately, effective for temporizing in many medical situations—consider, say, an accident where people are injured and the rescue team sees the patient long before a physician does, or a jam-packed but grossly understaffed city hospital emergency room on a Friday night—hard ethical decisions are common throughout medicine. An effective “telling” of the story and an empathetic yet critical “reading” of it are essential to arriving at the best possible decision. Inaccuracies in the telling and reading can lead to mistakes. An additional factor is that psychological issues, acute and chronic, can distort both the telling and reading.

So there it is, a few thoughts about storytelling in science, medicine and fiction—lots of speculation. Writing this in the context of Darren Schrieber's excellent piece has gotten me more interested in formally exploring some of these ideas—and more carefully formulating them, figuring out what has already been done in this area and what, if anything, is testable. The novelist in me is willing to let this journalistic treatment find its way into an academic compilation surrounded by more rigorous

accounts of matters related to neuroethics. The academic physician-scientist in me screams for a much more scholarly treatment after a thorough look at existing publications that bear on the problem.

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