

# Imagination, Theory, Story

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Hmm. Separate the visual fields so the right eye cannot see what the left eye sees. Show a picture of a snow scene to the left eye, show a picture of a chicken foot to the right eye. The left eye connects with the right brain hemisphere; the right with the left. A special condition pertains to this little scenario: the person looking at these pictures has had severed his corpus collosum, the neurological super highway that connects brain hemispheres, so his brain hemispheres work independently. Now show the person groups of pictures visible simultaneously to both eyes from which he is to select an object that is related to each picture he sees. He correctly chooses, among a series of objects, a shovel to match the snow scene and he also correctly matches, among a group of objects, a chicken to correlate with the chicken foot. The left hemisphere has the special capacities for quantitative concerns and language and speech. Michael Gazzaniga refers to it as the “interpreter.”<sup>1</sup> The right brain, which Diane Ackerman calls “the strong silent one,”<sup>2</sup> is concerned more with emotion and intuition (a feeling kind of knowing). When this two-brained person is asked why he selected the shovel (chosen by the silent right hemisphere) his left brain must speak for the choice made by the right brain, yet it cannot communicate directly with it. Rather than being befuddled about the shovel, he immediately responds “Oh, that’s simple. The chicken claw goes with the chicken, and you need a shovel to clean out the chicken shed.”<sup>3</sup>

Herein lays a most fascinating revelation about being human. Our brains come equipped to make up stories. They have the mission to do so in order to explain and justify the world we live in and the actions we take. Note that what the left brain does automatically, instantly, naturally, and seemingly without conflict, is to examine the factors at hand—chicken, chicken foot, and shovel—all three in the left hemisphere and construct an hypothesis about how these objects relate. Then to use a logical argument chicken is to chicken foot so the inference is that the shovel must have something to do with chickens which very logically would be to clean out the chicken shed. One small problem is that there is no chicken shed and the silent right brain hemisphere accurately selected and thus knows, but cannot tell the left brain that the shovel matches the snow scene, quite distant from a chicken shed.

Such behavior may be disturbing on the one hand. If we acknowledge this behavior, we must conclude that our left brains are habitual prevaricators and perhaps we should thank god for the moral control exerted by the right brain. But surely the creative intuitive right brain is otherwise occupied. To contemplate that this left brain hemisphere—the one most closely associated with rational thought and language—is built to make up stories raises complicated and frightening questions about those rational, logical, objective processes we so strongly rely on in our studies, our research, and our lives.

However, we might find the presence of chicken shit in this story a source of wonderful humor and delight at our hardwired human brainy being. Human beings are story-makers and storytellers. I have

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<sup>1</sup> Gazziniga, pp. 124-29.

<sup>2</sup> Diane Ackerman, *An Alchemy of Mind: The Marvel and Mystery of the Brain* (New York: Scribner, 2004)

<sup>3</sup> Gazziniga, p. 124.

on more than one occasion written about what I think is so engaging about the word story. I accepted the invitation to revise my book *Native American Religions* for the sole reason that I wanted to tell several stories. In the epilogue of that book I wrote, "I particularly like the ambiguity of the word story. It is commonly used to refer to myth, folktale, anecdote, history, as well as an out-and-out lie. Often we never know."<sup>4</sup> It is the never knowing that I most love. Where's the fun in finding out?

In the epilogue of that book I recounted in personal terms a number of stories related to my studies of Native American religions and my own life history. They were stories about stories, both told and untold. One of those stories was about my father's family. I recount my childhood when I had a wonderful relationship with my grandmother and my adventures as a farm kid. Then I told about my interest in tracing genealogy and that, after my grandmother died, I was given a bible of hers. Consulting the pages in the bible that recorded births, marriages, and deaths I discovered something of interest. Recounting what I found in the bible, I wrote, "Mattie Delphine Fulton [my grandmother] was born in the year 1870 in Zenia, Ohio, to Isaac B. Fulton and Ruth Ellen McGoogen. And in tiny fine script beside her name was written 'born Saskwehana.' My dad always told me that Elizabeth was a descendant of the president Adams family and that Isaac Fulton was a descendent of Robert Fulton, the inventor of the steamboat. These are his stories, now also mine and it seems there were other stories left untold." Of course, I was referring to the untold story about the inclusion, using a fine pen, which indicated that my great grandmother was born with an Indian name. I think it is funny that no one has ever asked me about this.

I focused on my mother's family in another story I wrote for this epilogue. In this story I recounted the family history that placed my mother's aunts, when they were children, with their family at the land rush that took place to open the Oklahoma Strip in 1889. After I recalled some of the stories they had told me about their encounters with some outlaws known as the Dalton Gang, I turned to a ribbon tied bundle of letters I found putting things in order after my mother's death. These were letters written among the sisters, siblings of my mother's grandmother. The cursive in these letters was written first in one direction on the paper and then the paper was turned ninety degrees and written the other direction overlaying the first, a method used when paper was scarce. I tell of reading these letters and I give some detail of one in particular. Here's what I wrote, "One letter dated March 1881 was to Susan Maria Bales (b.1853) wife of Joseph Avey, from her sister, Sarah. A line from that letter reads, 'Joy be to God that Ocy Lenore [my mother's mother] was born healthy and sound into the wilderness you call home. The secret of your Cherokee paramour is safe with me, though Ocy's features may one day betray you.' The hint of a story swallowed by the territory and time." No one has ever asked me about this either.

N Scott Momaday once wrote that people can endure anything if it is rendered into a story.

There is a conjunction between story and science and between story and belief. The structure of story proceeds from a condition of incongruity or incredulity, to the creation of an hypothesis that can render this condition congruous, and then on to recount the evidence to support the conclusion. This is the

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<sup>4</sup> Sam Gill, *Native American Religions: An Introduction* (Wadsworth, 2<sup>nd</sup> ed. 2004), p. 129.

scientific method: motivating problem, hypothesis, data, argument, conclusion. Belief works pretty much the same way. And curiously, given our distancing of science and religious and other belief systems, as Gazzaniga shows,<sup>5</sup> both tend to focus on supportive information while quickly dismissing conflicting information. Seems as humans we want to understand the world and are happier with a good story than with being completely objective, disinterested, and technically correct. Where's the fun in that?

While I respect the immense knowledge and experience of Michael Gazzaniga's long career in brain science, there could scarcely be a greater divide between his beliefs and mine regarding what distinguishes human greatness. The conclusion to his chapter called "Selecting for Mind," reads this way, "When the interpreter goes to work on more complex events, the resulting hypotheses and beliefs about the world also seem resistant to change. Even though the similarities are striking [I think he means the similarity between hypotheses and beliefs], the quintessential human property of mind—rational processes—can occasionally override our more primitive beliefs. It isn't easy, but when it occurs, it represents our finest achievement."<sup>6</sup>

Frankly I'll put my destiny with the invention of chicken shit. I'll try out my own rational faculties here. It seems to me that rational processes are not engaged until an hypothesis is present. So where do hypotheses come from? Certainly not rational thought.<sup>7</sup> The issue is, how do we think a new thought. Or, put differently, how do we make up a new story? Gazzaniga was interested in showing that, from infancy, our brains are designed to interpret. He recounted the research done on infants to discern what knowledge and types of awareness are built in to being human and those that are not. Since infants cannot answer questions, an infant's knowledge is measured by its reactions as reflected in its facial expression and bodily comportment. Infants have little or no change in expression or body comportment for things they expect or know, while they show an expression of surprise for things they do not know. Gazzaniga and others are focused on documenting that infants are pre-set with some knowledge. What they ignore, but take for granted, is, to me, the more interesting thing. And this is that babies have obvious bodily responses to surprises. Yes, "surprise" is the word Gazzaniga uses to describe it. Also in a figure<sup>8</sup> the infant's surprise is graphically shown by a thought bubble with an exclamation mark and a question mark in it (!?).

Charles Sanders Peirce studied hypothetic inference throughout his entire life and I don't believe that his work has been surpassed or even adequately integrated into how we understand ourselves.<sup>9</sup> We are all taught in science classes about the two standard inferential methods: induction and deduction. These are "rational processes," those wonderful "high minded" processes Gazzaniga so loves. Peirce,

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<sup>5</sup> Gazzaniga, *Nature's Mind*, p. 135-37.

<sup>6</sup> *Ibid.*, p. 137.

<sup>7</sup> C. S. Peirce argued that this process has a rational base simply because hypotheses are so often supportable while a random hypothesis would not be; however, clearly for him this was not a conscious rational process.

<sup>8</sup> *Ibid.*, Figure 6.2.

<sup>9</sup> See Charles Sanders Peirce, *Collected Papers*, vols. 1-6, ed. C. Hartshorne and P. Weiss, vol 7-8, ed. A. W. Burks (Cambridge: Harvard University Press, 1931-58), 5.196 and K. T. Fann, *Peirce's Theory of Abduction* (The Hague: Martinus Nijhoff, 1970).

however, noted that neither of these methods increases our knowledge by one whit (his term). Why? Well, he argued that since they are rational processes they simply move around in different ways what is already known. The real issue for Peirce was how we think something new and throughout his entire life he wrote on this topic again and again, usually using the term “abduction;” sometimes alternately “hypothetic inference.” The term is, to me, quite fascinating. Technically abduction refers to the movement away from the center. But it also means to be caught or captured by something; kidnapped as it were.

Peirce argued that abduction differs in kind from induction and deduction in that it is not strictly a consciously used rational process. Rather, the process that gives rise to a hypothesis is initiated by the element of surprise and the subconscious iterative process that is initiated by the visceral experience of being surprised. Hypotheses arise for the purpose of dissipating the emotion of surprise. Abduction, Peirce said, is a “feeling kind of knowing.”<sup>10</sup> It is the rise of belief, of hypothesis, of a kind of knowing that isn’t yet established by conscious rational process of inductive or deductive reasoning, by the objective application of data; but it is the kind of knowledge that is most fully felt.<sup>11</sup> Peirce referred to it as a “best guess;” Ackerman wrote, “We’re devotees of the hunch, estimate, and best guess.”<sup>12</sup> It is why we constantly ask “why?” It is the kind of knowing that can, using other inferential methods, be extended in useful ways to the world around us. It is the knowing that grounds us, drives us, impassions us, and that, because it is felt, experienced in our bodies, is inseparable from emotion, motion, and life. We see on infant faces the birth of this distinctive human trait.

So while Gazzaniga is more interested in documenting that infants come prepackaged with certain kinds of knowledge expectation, I am much more impressed that they come prepackaged with abductive capacities which even in infancy show that the body is inseparable from the mind, that even infants are capable of feeling surprised, of inventing a little chicken shit where needed. Surprise and the accompanying feeling kind of knowing ground our creativity, our stories, our art, our ritual, our myths, our sciences—all these lies that feel like truths. Gazzaniga’s longing for that rare human moment when a primitive belief may be bludgeoned to death by that quintessential human property of mind reminds me of those who commonly identify religion with those mountain top experiences of enlightenment or transcendence. They can await their pinnacle moments for all I care. For my taste—okay, maybe it’s one of my many primitive beliefs—give me a good surprise any old day, a nice crisis, a nasty blow, a crappy response to a lecture from my students. Our innate capacity to invent some chicken shit is our finest achievement.

Circling back, let me ask some questions and reflect a bit more on these experiments Gazzaniga performed. In the process in which the subject creates an hypothesis or makes up a story or offers an explanation when the conditions are counter to the broader set of facts is presumably a different process than occurs when a person with the full set of data simply identifies a match. If it were not a different process then I think the results of Gazzaniga’s example must be reconsidered. That is, a person

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<sup>10</sup> Ibid.

<sup>11</sup> Peirce here anticipates the discussion of blending in Fauconier and Turner. See Lecture 13

<sup>12</sup> Ackerman, p. 15.

whose right and left hemispheres are communicating will describe the selection of the shovel in terms of the apparently logical match to the snow scene. While, I presume that there must be a different process and sequence of processing that occurs for the person who must deal with the external demand to make coherence of the three images—chicken foot, chicken, and shovel—co-residing in the left brain. The first or whole brain problem demands that the person identify and describe the coherence observed which seems somehow natural, at least unquestioned. The second or left brain problem demands that the person state the coherence among these images even though the condition of coherence used by the right hemisphere to make the choice is, in the left hemisphere, initially one of incoherence. Thus the left brain engages the interpreter or other mechanism to fabricate, seemingly unconsciously, an explanation. Now the problem I have here is that there seems to be an assumption that there is some objective and natural connection between chicken and chicken foot and winter snow scene and a shovel. In other words, the experiment seems to be built on the premise that there is a “correct” correlation between the dominant images and only one among the four possible matching images. This seems to me to suggest that coherence is then somehow “natural” or automatic and resides apart from the left-brain “interpreter.” Because the right brain selected the shovel to match the snow scene without the left brain being involved would seem to be evidence of this.

These observations raise a couple of issues for me. I’d like to see a much greater range of examples presented to these subjects to explore further this mechanism of identifying coherence. What if the shovel and the chicken head were removed from the choices and the subject was still asked to choose the best match. Are there any ways in which one would find a way to choose a lawnmower, or a rake, or a pickaxe to match a snow scene? Are there any ways in which an apple or a toaster or a hammer could be selected to match a bird foot? Given the operation of the “interpreter “ in the left hemisphere, one would presume that it would not simply be stymied but would rather construct some sort of story to explain a selection of any one of these three choices. The question is then would the right brain, which presumably does not have an interpreter, be simply stymied? I’d guess some choice would still be made. Another layer of this problem is how would we state the principle underlying the coherence of these choices? Seems that the foot of a fowl (which Gazzaniga interestingly continues to insist on naming with the term “claw”) is paired with the rooster head (which interestingly Gazzaniga insists on naming as a “chicken”). Seems the principle of coherence is two potential parts of the body cohere because of the unity of a body. In the second match a snowy winter scene is matched with a shovel (which doesn’t necessarily look much like a “snow shovel”) on a different principle of coherence, namely, that a shovel is a tool commonly used to remove snow, even though there appears no urgency in the scene that snow need be removed. The left side images principle of coherence seems to me to be a looser connection than the right side principle thus requiring a greater degree of interpretation. What is intriguing to me about this is that this looser connection was presented to the right hemisphere which apparently does not have an “interpreter.” How much looser the association would be possible for the right hemisphere to “silently” still be able to make the choice.

The second issue that is raised by these concerns is the matter of coherence. It seems to me that coherence is a condition that is simply taken for granted. For us to understand these processes more fully we need to try to understand coherence more fully. It would seem that Gazzaniga’s experiments

would suggest that coherence is both a product of the process of the interpreter, that is in offering explanation for selecting the shovel to clean out the chicken shed, but also a product of some process that operates outside of the interpreter, since the shovel was selected because of some evaluation of coherence and degrees of coherence by the interpreter-less right brain.

Peirce finds that surprise is foundational to both these processes, that coherence is not the product of some logical interpretive operation, but rather is the product of processes initiated by the interoceptive feeling condition of surprise, or incoherence. Incoherence then is the deeper embodied condition that is felt rather than thought or reasoned, yet it initiates a process of hypothetic inference or artifice that dissipates or relieves the visceral feeling of surprise by constructing coherence (which may be done in any number of ways). It would follow then that the right brain must be doing this rationalizing or theorizing or story-constructing just as much as does the left brain, yet it would seem to do so necessarily rather differently. The immediate question would be then, what is the mechanism used in the right brain for this process?

The implications of these reflections is significant and illuminates some important aspects of this whole process that is not discussed by Gazzaniga, one would presume because he is focused on the central nervous system (the brain in the skull) and with his special investment in the importance of the “interpreter.” The implications are that all mental processes of seeming reason (as performed by the interpreter) or hypothetic inference or story-making are initiated and motivated by feeling types of knowing, the feeling of surprise or incoherence or incongruity, etc. These occur quite literally in the gut and, since these present the condition that then demands some “explanation” one can appreciate why it is so difficult to change our stories or to abandon our hypotheses. To do so would result in dropping the wall that is guarding against the feelings of surprise.

These are a few notes on the consideration of “coherence;” much more need be done. Yet, even this much reflection can provide new insight in returning to Jonathan Smith’s important discussion of difference as the foundational basis for comparison as “the” method for the academic study of religion. Building on Ricoeur, Smith often uses the statement “incongruity gives rise to thought” or we might rephrase this as “incoherence gives rise to thought.” Unpacking this statement a bit, it appears to say that thought (Gazzaniga’s “interpreter”?) does not occur other than as the result of incongruity or incoherence which, since thought has yet to rise, is then apparently not logical or interpreted. What conditions can they possibly be other than felt conditions or interoceptive or visceral perceptions? It would appear then that thought may take place in the brain, but it is always motivated by the muscles/bones/viscera. We simply have to acknowledge that the results of this discussion are of major importance. And these conclusions are gaining increasing support from neuroscience and cognitive science.

Okay, one last consideration provoked by Gazzaniga’s experiment. We are broadening our understanding of meaning/cognition/mind to reject their confinement to the brain, the central nervous system, to include the efferent signals that are initiated in the sensorimotor cortex but directed to the firing of muscle fibers throughout the body, but also the afferent signals from the proprioceptive system that provide something of a feedback loop to the spinal column and the central nervous system.

Further, we have just followed a scenario in which the functions of the “interpreter” in the brain is driven by the interoceptive and visceral perceptual systems, which means that this afferent aspect of the neurological system is not simply feedback and thus secondary, but may be as primary and initiatory, perhaps even more so, than the central nervous system. Finally, if we can posit that this is so, then we need to ask if afferent signals from viscera are bifurcated and hemispheric specific. Do these signals from the gut go only to the right brain or to the left brain or are they somehow distributed between them. I don’t know the answer to this. Presumably neuroscientists do ... I’ll ask, but this offers us a rather interesting reinterpretation of Gazzaniga’s experiment.

In this scenario, both brain hemispheres would not simply retain the visual stimulus of two images in the brain, but would react to these images by engaging in the full sensorimotor programming schemas variously called “body concepts,” “image schemas,” and “gestures/postures.” In other words, when a picture of the foot of a fowl appears this triggers sensorimotor programs related to our experience with such an image. These programs are distributed throughout the body rather than confined in a single hemisphere. If, the afferent signals from these sensorimotor programs are not hemisphere specific then it is quite possible that the images seen only by the right brain are engaged in the body where coherence is felt, or even actually processed in the left hemisphere which then provides interoceptive sensations that are afferently acknowledged in the right brain.

In any of these considerations, the essential point is that an analysis of Gazzaniga’s experiment confined only to what is contained in the skull is totally inadequate and far less interesting than we might have first felt.

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Okay, I have some issues with the implications made by Norman Doidge, in his book *The Brain That Changes Itself*, regarding the work of Alvaro Pascual-Leone and others.<sup>13</sup> Certainly I need to caution myself about dismissing information that contrasts with my own beliefs. There is increasing evidence about how our beliefs shape, even determine, our analysis. So be it. At least I’m going to talk about it. These are the studies that show that we can acquire bodily skills, such as playing piano, and that we can build body strength, by simply imagining our bodies performing these tasks.

Let me fast forward to those Winter Olympic personal moments where we see an ice skater with earphones on, eyes closed, sitting behind stage awaiting her performance. We are told that she is imagining her performance, seeing herself with her mind’s eye (why is this always singular? Shouldn’t it be mind’s eyes?). I get that and realize that it really works. I practice this technique myself in dancing. When also told that doing this imagination exercise also fires the same neurons as actually doing the skating, I’m okay with that, too. After all they can document this with an fMRI. My embodied beliefs get in the way, however, since I don’t think this imagination process can work for very long or can on its own make but the smallest progress toward building bodily skill and strength. By the fifth day of piano

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<sup>13</sup> Doidge, pp. 196-202.

finger exercises, we are told, there was some small discrepancy beginning to appear, but this was made up for by two hours of physical practice.

I don't have a problem with the implication that imagination and action are truly integrated and actually cause changes in cells and tissues; that sounds obvious. I just have a problem with moving to the conclusion that Doidge makes that "the brain is so easily altered."<sup>14</sup> Two comments here. First, were the brain so easily altered I believe we would be in a perpetual state of chaos. I know a woman who spent ten days on a rough sea in Indonesia. Her brain responded too quickly to remap itself to these challenging conditions. Now off the sea, for many months her brain has stubbornly retained this mapping and she can scarcely walk, she is dizzy, she has short-term memory problems. If our brains are always this plastic any brief conditioning would rewire them to the new condition and we would be in a constant turmoil to have brain mappings that we could simply rely on to allow us to live our lives.

Second, were this imagination method of acquiring bodily skill and strength capable of extending beyond preliminary beginning stages or refining and fine tuning, we could start schools where we simply had students imagine playing piano every day without ever touching a piano with some expectation that they might be capable at their first bodily encounter with an actual piano of playing Bach after a couple hours practice. We should expect that a weight-lifter might imagine himself lifting weights without ever going to the gym and he could watch his muscles physically grow. Might we expect that he gain the benefits of nutritional supplements by imagining taking them? Maybe I am going a bit too far; being driven by my primitive beliefs. I am all for brain plasticity, but were these effects of imagination actually possible, I'd still prefer to hear my wrong notes on a physical piano and drip with sweat in the gym.

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So what does this have to do with our studies of religion and culture? The old notion of *homo religiosus* is interesting. This term "man the religious" suggests that humans are religious by nature; we are designed as religious beings. This belief has been used and misused by students of religion for some time. The studies of how our brains are wired and what they are designed to do, gives us some insight into what it means to be human. It appears clear that human brains are designed to be surprised by what they don't know and that this condition of surprise is instantly physically reflected throughout our bodies; that the brain/body has sensorimotor and emotional/feeling components. Indeed, there is some evidence that surprise is viscerally initiated and then sent to the interpreter in the left hemisphere to make up a story of offer an hypothesis to dissipate the emotion. A rich theory of gesture suggests that our sensorimotor (our central nervous system/interoceptive system) actions are designed to include some openness and receptiveness to the unexpected, the incongruous, the incredulous. Thus surprise, the motivator of hypothetic inference and story-making, is systemic. The experience of surprise engages the "interpreter" or potentially other neurophysiological processes, as I have suggested, built to create stories which may take the form of fictions, hypotheses, beliefs, guesses, hunches. It appears that we are designed so that our best guesses are more readily confirmed rather

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<sup>14</sup> Doidge, p. 209.



than challenged; that we actually feel, that is, have emotions, related to those things that threaten or challenge or confirm our theories and beliefs.

Our propensities to create stories that diminish our surprises, our confoundments, our incredulities are surely as much at the heart of religion as they are of science. Religion creates and abides by story, myth, beliefs; science by hypotheses, inferential rational processes, and theories. I can't see how we can possibly understand these as separate in any way other than the contexts and contents. If you stand with Gazzaniga, you'll understand religion as limited to those rare and rarified moments of transcendence, enlightenment, balance, harmony, heaven, order, being centered, goodness, and ... what comes next ... sweetness? If you are with me, you'll see religion as conflict, wonder, struggle, repetitive acts of ritual dancing singing walking praying crying fighting arguing storytelling mythmaking searching ... what comes next ... suffering and sacrificing and pain and dying.

I also believe that as students of religion we haven't known much what to do with story, folklore, myth, and ritual. What our scientific colleagues are showing us is that our brains are designed to make stories, myths, tales, and many of those arts are understood as lies that tell the truth. And they typically have a understanding of the nervous system as limited to residence in the skull. Surely we should be comforted, on the one hand, by this information and energized and inspired by it, on the other, to return with new appreciation and interest to these aspects we know are essential to religions and cultures.

