A WHOLE NEW MIND

WHY RIGHT-BRAINERS WILL RULE THE FUTURE

Daniel H. Pink

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One

RIGHT BRAIN RISING

The first thing they do is attach electrodes to my fingers to see how much I sweat. If my mind attempts deception, my perspiration will rat me out. Then they lead me to the stretcher. It's swaddled in crinkly blue paper, the kind that rustles under your legs when you climb onto a doctor's examination table. I lie down, the back of my head resting in the recessed portion of the stretcher. Over my face, they swing a cagelike mask similar to the one used to muzzle Hannibal Lecter. I squirm. Big mistake. A technician reaches for a roll of thick adhesive. "You can't move," she says. "We're going to need to tape your head down."

Outside this gargantuan government building, a light May rain is falling. Inside—smack in the center of a chilly room in the subbasement—I'm getting my brain scanned.

I've lived with my brain for forty years now, but I've never actually seen it. I've looked at drawings and images of other people's brains. But I don't have a clue as to what my own brain looks like or how it works. Now's my chance.

For a while now, I've been wondering what direction our lives will take in these outsourced, automated, upside-down times—and I've begun to suspect that the clues might be found in the way the brain is organized. So I've volunteered to be part of the control group—what researchers call "healthy volunteers"—for a project at the National Institute of Mental Health, outside Washington, D.C. The study involves capturing images of brains at rest and at work, which means I'll soon get to see the organ that's been leading me around these past four decades—and, in the process, perhaps gain a clearer view of how all of us will navigate the future.

The stretcher I'm on juts from the middle of a GE Signa 3T, one of the world's most advanced magnetic resonance imaging (MRI) machines. This $2.5 million baby uses a powerful magnetic field to generate high-quality images of the inside of the human body. It's a huge piece of equipment, spanning nearly eight feet on each side and weighing more than 35,000 pounds.

At the center of the machine is a circular opening, about two feet in diameter. The technicians slide my stretcher through the opening and into the hollowed-out core that forms the belly of this beast. With my arms pinned by my side and the ceiling about two inches above my nose, I feel like I've been crammed into a torpedo tube and forgotten.

TCHKK! TCHKK! TCHKK! goes the machine. *TCHKK! TCHKK! TCHKK!* It sounds and feels like I'm wearing a helmet that somebody is tapping from the outside. Then I hear a vibrating

ZZZHHHH! followed by silence, followed by another *ZZZHHHH!* and then more silence.

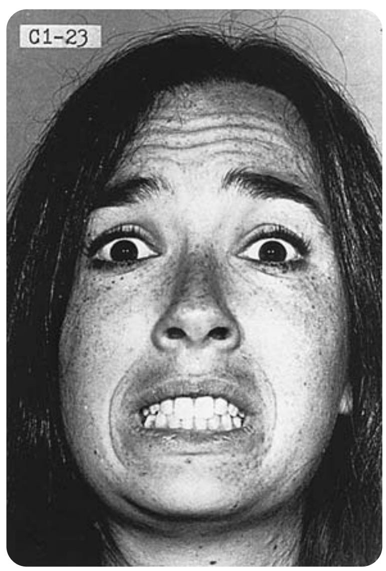
After a half hour, they've got a picture of my brain. To my slight dismay, it looks pretty much like every other brain I've seen in textbooks. Running down the center is a thin vertical ridge that cleaves the brain into two seemingly equal sections. This feature is so prominent that it's the first thing a neurologist notes when he inspects the images of my oh-so-unexceptional brain. "[The] cerebral hemispheres," he reports, "are grossly symmetric." That is, the three-pound clump inside my skull, like the three-pound clump inside yours, is divided into two connected halves. One half is called the left hemisphere, the other the right hemisphere. The two halves look the same, but in form and function they are quite different, as the next phase of my stint as a neurological guinea pig was about to demonstrate.

That initial brain scan was like sitting for a portrait. I reclined, my brain posed, and the machine painted the picture. While science can learn a great deal from these brain portraits, a newer technique—called *functional* magnetic resonance imaging (fMRI)—can capture pictures of the brain in action. Researchers ask subjects to do something inside the machine—hum a tune, listen to a joke, solve a puzzle—and then track the parts of the brain to which blood flows. What results is a picture of the brain spotted with colored blotches in the regions that were active—a satellite weather map showing where the brain clouds were gathering. This technique is revolutionizing science and medicine, yielding a deeper understanding of a range of human experience—from dyslexia in children to the mechanisms of Alzheimer's disease to how parents respond to babies' cries.

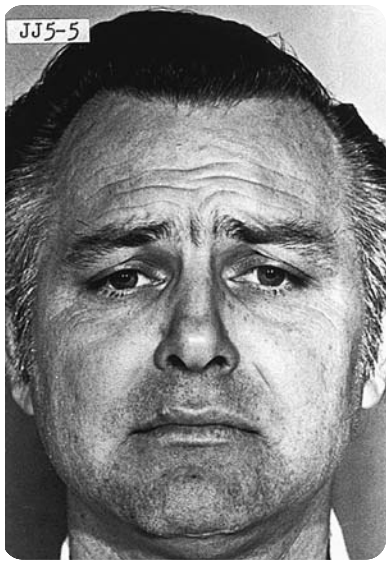
The technicians slide me back inside the high-tech Pringles can. This time, they've set up a periscopelike contraption that allows me to see a slide screen outside the machine. In my right hand is a small clicker, its cord attached to their computers. They're about to put my brain to work—and provide me with a metaphor for what it will take to thrive in the twenty-first century.

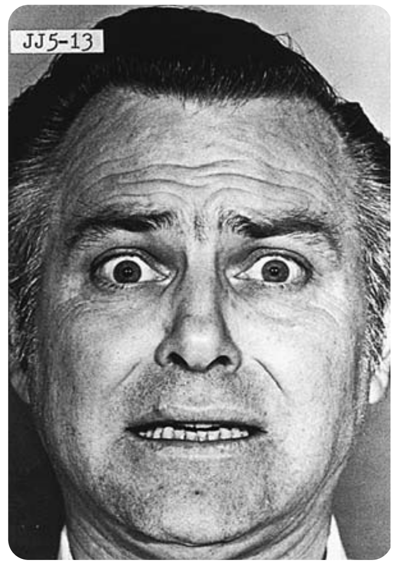
My first task is simple. They display on the screen a black-and-white photo of a face fixed in an extreme expression. (A woman who looks as if Yao Ming just stepped on her toe. Or a fellow who apparently has just remembered that he left home without putting on pants.) Then they remove that face, and flash on the screen two photos of a different person. Using the buttons on my clicker, I'm supposed to indicate which of those two faces expresses the same emotion as the initial face.

For example, the researchers show me this face:



Then they remove it and show me these two faces:





I click the button on the right because the face on the right expresses the same emotion as the earlier face. The task, if you'll pardon the expression, is a no-brainer.

When the facial matching exercise is over, we move to another test of perception. The researchers show me forty-eight color photos, one after another, in the manner of a slide show. I click the appropriate button to indicate whether the scene takes place indoors or outdoors. These photos occupy two extremes. Some are bizarre and disturbing; others are banal and inoffensive. The photos include a coffee mug sitting on a counter, several people brandishing guns, a toilet overflowing with waste, a lamp, and a few explosions.

For instance, the researchers display an image like this:*

So I click the button that indicates that this scene takes place inside. The task requires that I concentrate, but I don't much strain. The exercise feels about the same as the previous one.

What happens inside my brain, however, tells a different story. When the brain scans appear on the computers, they show that when I looked at the grim facial expressions, the right side of my brain sprang into action and enlisted other parts of that hemisphere. When I looked at the scary scenes, my brain instead called in greater sup-

*The photos I saw during this phase of the research came from a standard set of images called the International Affective Picture System (IAPS). The creator and owner of the IAPS, Professor Peter J. Lang of the University of Florida, requested that I not reproduce any of these images in this book. "Making these materials familiar to the general public can seriously compromise their value as stimuli in many research projects," he explained. The image I've reprinted, therefore, is not from the actual IAPS collection. But it is similar in subject, tone, and composition to the photos in this experiment.

port from the left hemisphere.[1] Of course, parts of both sides worked on each task. And I felt precisely the same during each exercise. But the fMRI clearly showed that for faces, my right hemisphere responded more than my left—and for gun-wielding bad guys and similar predicaments, my left hemisphere took the lead.

Why?

The Right (and Left) Stuff

Our brains are extraordinary. The typical brain consists of some 100 billion cells, each of which connects and communicates with up to 10,000 of its colleagues. Together they forge an elaborate network of some one *quadrillion* (1,000,000,000,000,000) connections that guides how we talk, eat, breathe, and move. James Watson, who won the Nobel Prize for helping discover DNA, described the human brain as "the most complex thing we have yet discovered in our universe."[2] (Woody Allen, meanwhile, called it "my second favorite organ.")

Yet for all the brain's complexity, its broad topography is simple and symmetrical. Scientists have long known that a neurological Mason-Dixon Line divides the brain into two regions. And until surprisingly recently, the scientific establishment considered the two regions separate but unequal. The left side, the theory went, was the crucial half, the half that made us human. The right side was subsidiary—the remnant, some argued, of an earlier stage of development. The left hemisphere was rational, analytic, and logical—everything we expect in a brain. The right hemisphere was mute, nonlinear, and instinctive—a vestige that nature had designed for a purpose that humans had outgrown.

As far back as the age of Hippocrates, physicians believed that the left side, the same side that housed the heart, was the essential half.

And by the 1800s, scientists began to accumulate evidence to support that view. In the 1860s, French neurologist Paul Broca discovered that a portion of the left hemisphere controlled the ability to speak language. A decade later, a German neurologist named Carl Wernicke made a similar discovery about the ability to *understand* language. These discoveries helped produce a convenient and compelling syllogism. Language is what separates man from beast. Language resides on the left side of the brain. Therefore the left side of the brain is what makes us human.

This view prevailed for much of the next century—until a soft-spoken Caltech professor named Roger W. Sperry reshaped our understanding of our brains and ourselves. In the 1950s, Sperry studied patients who had epileptic seizures that had required removal of the corpus callosum, the thick bundle of some 300 million nerve fibers that connects the brain's two hemispheres. In a set of experiments on these "split-brain" patients, Sperry discovered that the established view was flawed. Yes, our brains were divided into two halves. But as he put it, "The so-called subordinate or minor hemisphere, which we had formerly supposed to be illiterate and mentally retarded and thought by some authorities to not even be conscious, was found to be in fact the superior cerebral member when it came to performing certain kinds of mental tasks." In other words, the right wasn't inferior to the left. It was just different. "There appear to be two modes of thinking," Sperry wrote, "represented rather separately in the left and right hemispheres, respectively." The left hemisphere reasoned sequentially, excelled at analysis, and handled words. The right hemisphere reasoned holistically, recognized patterns, and interpreted emotions and nonverbal expressions. Human beings were literally of two minds.

This research helped earn Sperry a Nobel Prize in medicine, and forever altered the fields of psychology and neuroscience. When

Sperry died in 1994, *The New York Times* memorialized him as the man who "overturned the prevailing orthodoxy that the left hemisphere was the dominant part of the brain." He was the rare scientist, said the *Times,* whose "experiments passed into folklore."[3]

Sperry, though, had some help transporting his ideas from the laboratory to the living room—in particular, a California State University art instructor named Betty Edwards. In 1979, Edwards published a wonderful book titled *Drawing on the Right Side of the Brain.* Edwards rejected the notion that some people just aren't artistic. "Drawing is not really very difficult," she said. "Seeing is the problem."[4] And the secret to seeing—really seeing—was quieting the bossy know-it-all left brain so the mellower right brain could do its magic. Although some accused Edwards of oversimplifying the science, her book became a bestseller and a staple of art classes. (We'll learn about Edwards's techniques in Chapter 6.)

Thanks to Sperry's pioneering research, Edwards's skillful popularization, and the advent of technologies like the fMRI that allow researchers to watch the brain in action, the right hemisphere today has achieved a measure of legitimacy. It's real. It's important. It helps make us human. No neuroscientist worth her PhD ever disputes that. Yet beyond the neuroscience labs and brain-imaging clinics, two misconceptions about the right side of the brain persist.

The Wrong Stuff

These two misconceptions are opposite in spirit but similar in silliness. The first considers the right brain a savior; the second considers it a saboteur.

Adherents of the savior view have climbed aboard the scientific evidence on the right hemisphere and raced from legitimacy to reverence. They believe that the right brain is the repository of all that is good and just and noble in the human condition. As neuroscientist Robert Ornstein puts it in *The Right Mind*, one of the better books on this subject:

> Many popular writers have written that the right hemisphere is the key to expanding human thought, surviving trauma, healing autism, and more. It's going to save us. It's the seat of creativity, of the soul, and even great casserole ideas.[5]

Oh, my. Over the years, peddlers of the savior theory have tried to convince us of the virtues of right-brain cooking and right-brain dieting, right-brain investing and right-brain accounting, right-brain jogging and right-brain horseback riding—not to mention right-brain numerology, right-brain astrology, and right-brain lovemaking, the last of which may well lead to babies who'll eventually achieve greatness by eating right-brain breakfast cereal, playing with right-brain blocks, and watching right-brain videos. These books, products, and seminars often contain a valid nugget or two—but in general they are positively foolish. Even worse, this cascade of baseless, New Age gobbledygook has often served to degrade, rather than enhance, public understanding of the right hemisphere's singular outlook.

Partly in response to the tide of inane things that have been said about the right brain, a second, contrary bias has also taken hold. This view grudgingly acknowledges the right hemisphere's legitimacy, but believes that emphasizing so-called right-brain thinking risks sabotaging the economic and social progress we've made by applying the force of logic to our lives. All that stuff that the right hemisphere does—interpreting emotional content, intuiting answers, perceiving things holistically—is lovely. But it's a side dish to the main course of true intelligence. What distinguishes us from other animals is our ability to reason analytically. We are humans, hear us calculate. That's what makes us unique. Anything else isn't simply different; it's *less.* And paying too much attention to those artsy-fartsy, touchy-feely elements will eventually dumb us down and screw us up. "What it comes down to," Sperry said shortly before he died, "is that modern society [still] discriminates against the right hemisphere." Within the saboteur position is the residual belief that although the right side of our brains is real, it's still somehow inferior.

Alas, the right hemisphere will neither save us nor sabotage us. The reality, as is so often the case with reality, is more nuanced.

The Real Stuff

The two hemispheres of our brains don't operate as on-off switches—one powering down as soon as the other starts lighting up. Both halves play a role in nearly everything we do. "We can say that certain regions of the brain are more active than others when it comes to certain functions," explains one medical primer, "but we can't say those functions are confined to particular areas."[6] Still, neuroscientists agree that the two hemispheres take significantly different approaches to guiding our actions, understanding the world, and reacting to events. (And those differences, it turns out, offer considerable guidance for piloting our personal and professional lives.) With more than three decades of research on the brain's hemispheres, it's possible to distill the findings to four key differences.

1. The left hemisphere controls the right side of the body; the right hemisphere controls the left side of the body.

Raise your right hand. Seriously, if you can, hold your right hand high in the air. Your left hemisphere (or, more accurately, a region of your left hemisphere) did that. Now, if you're able, tap your left foot. A region of your right hemisphere did that. Our brains are "contralateral"—that is, each half of the brain controls the opposite half of the body. That's why a stroke on the right side of someone's brain will make it difficult for that person to move the left side of her body and a stroke on the left side will impair the functioning of the right. Since roughly 90 percent of the population is right-handed, that means that in roughly 90 percent of the population, the left hemisphere is controlling important movements such as handwriting, eating, and maneuvering a computer mouse.

Contralateralization comes into play, not only when we sign our name or kick a ball, but also when we move our heads and our eyes. Here's another exercise. Turn your head slowly to the left. Once again, the opposite hemisphere—the right side of your brain—largely guided that maneuver. Now turn your head slowly to the right. This time, the left hemisphere did the steering. Now, using whichever part of your brain you'd like, think of an activity that involves the latter movement—that is, slowly moving your head and eyes from left to right. Here's a hint: you're doing it now. In Western languages, reading and writing involve turning from left to right, and therefore exercise the brain's left hemisphere. Written language, invented by the Greeks around 550 B.C.E., has helped reinforce left hemisphere dominance (at least in the West) and created what Harvard classicist Eric Havelock called "the alphabetic mind."[7] So perhaps it's no surprise, then, that the left hemisphere has dominated the game. It's the only side that knows how to write the rules.

2. The left hemisphere is sequential; the right hemisphere is simultaneous.

Consider another dimension of the alphabetic mind: it processes sounds and symbols in sequence. When you read this sentence, you begin with the "when," move to the "you," and decode every letter, every syllable, every word in progression. This, too, is an ability at which your brain's left hemisphere excels. In the sequential words of one neuroscience textbook:

> [T]he left hemisphere [is] particularly good at recognizing *serial events*—events whose elements occur one after the other—and controlling sequences of behavior. The left hemisphere is also involved in controlling serial behaviors. The serial functions performed by the left hemisphere include verbal activities, such as talking, understanding the speech of other people, reading, and writing.[8]

By contrast, the right hemisphere doesn't march in the single-file formation of A-B-C-D-E. Its special talent is the ability to interpret things simultaneously. This side of our brains is "specialized in seeing many things at once: in seeing all the parts of a geometric shape and grasping its form, or in seeing all the elements of a situation and understanding what they mean."[9] This makes the right hemisphere particularly useful in interpreting faces. And it confers on human beings a comparative advantage over computers. For instance, the iMac computer on which I'm typing this sentence can perform a million calculations per second, far more than the fastest left hemisphere on the planet. But even the most powerful computers in the world can't recognize a face with anywhere close to the speed and accuracy of my toddler son. Think of the sequential/simultaneous difference like this: the right hemisphere is the picture; the left hemisphere is the thousand words.

3. The left hemisphere specializes in text; the right hemisphere specializes in context.

In most people, language originates in the left hemisphere. (This is true of about 95 percent of right-handers and 70 percent of left-handers. In the rest—about 8 percent of the population—the division of linguistic labor is more complicated.) But the right hemisphere doesn't cede full responsibility to the left. Instead, the two sides carry out complementary functions.

Suppose that one night you and your spouse are preparing dinner. Suppose, too, that midway through the preparations, your spouse discovers that you forgot to buy the dinner's most important ingredient. Suppose then that your spouse grabs the car keys, curls a lip, glares at you, and hisses, "I'm going to the store." Nearly everyone with an intact brain would understand two things about the words just uttered. First, your spouse is heading to Safeway. Second, your spouse is pissed. Your left hemisphere figured out the first part—that is, it deciphered the sounds and syntax of your spouse's words and arrived at their literal meaning. But your right hemisphere understood the second aspect of this exchange—that the ordinarily neutral words "I'm going to the store" weren't neutral at all. The glare of the eyes and the hiss of the voice signal that your spouse is angry.

Individuals with damage to one hemisphere can't reach this dual conclusion. A person with an impaired right hemisphere, and thus only a functioning *left* hemisphere, would hear such comments and understand that the spouse is driving to the store—but would remain oblivious to the anger and annoyance fueling the trip. A person with an impaired left hemisphere, and thus only a functioning *right* hemisphere, would understand that the spouse is miffed—but might not know where the spouse just went.

This distinction applies not only to understanding language but also to speaking it. Patients with damage to certain regions of their right hemisphere can talk coherently—abiding the rules of grammar and deploying a standard vocabulary. But as British psychologist Chris McManus notes in his prizewinning book *Right Hand Left Hand*:

> Their language . . . is not normal, lacking the musical quality of speech, prosody, whereby the tone goes up and down, and the words accelerate and decelerate or get louder and softer, providing emotion and emphasis. Speech without prosody is like those computer-synthesized voices one hears on telephones.[10]

To oversimplify just a bit, the left hemisphere handles *what* is said; the right hemisphere focuses on *how* it's said—the nonverbal, often emotional cues delivered through gaze, facial expression, and intonation.

But the distinction between left and right comprises more than the difference between verbal and nonverbal. The text/context distinction, originally put forward by Robert Ornstein, applies more broadly. For instance, certain written languages depend heavily on context. Languages such as Arabic and Hebrew are often written only in consonants, which means the reader must figure out what the vowel is by the surrounding concepts and ideas. In those languages, if you read the equivalent of "stmp n th bg," you'd fill in different vowels depending on whether the phrase appeared in a pest control manual ("stomp on the bug") or a short story about a trip to the post office ("stamp in the bag"). Unlike English, languages that require the reader to supply the vowels by discerning the context are usually written from right to left.[11] And as we learned a few pages ago, moving one's eyes in that direction depends on the brain's right hemisphere.

Context is also important in other dimensions of language. For example, many studies have shown that the right hemisphere is responsible for our ability to comprehend metaphors. If you tell me that José has "a heart the size of Montana," my left hemisphere quickly assesses who José is, what a heart is, and how big Montana is. But when the literal meaning of the sentence doesn't compute—how can a 147,000-square-mile heart fit inside José's modest chest cavity?—it calls in the right hemisphere to resolve the incongruity. The right hemisphere explains to the left that José doesn't have some bizarre cardiac condition but instead is a generous and loving person. "Neither side of the brain . . . can do the job without the other," Ornstein writes. "We need the text of our lives to be in context."[12]

4. The left hemisphere analyzes the details; the right hemisphere synthesizes the big picture.

In 1951, Isaiah Berlin wrote an essay about *War and Peace* and gave it a room-emptying title: "Leo Tolstoy's Historical Skepticism." Berlin's publisher loved the essay but hated the headline, so he changed the title to something catchier: "The Hedgehog and the Fox," after an ancient Greek adage, "The fox knows many things; the hedgehog knows one big thing." The retitled essay helped make Berlin famous. And the concept provides a useful way of illuminating a fourth difference between the two sides of our brain. The left side is a fox; the right side is a hedgehog.

"In general the left hemisphere participates in the *analysis* of information," says a neuroscience primer. "In contrast, the right hemisphere is specialized for *synthesis*; it is particularly good at putting isolated elements together to perceive things as a whole."[13] Analysis and synthesis are perhaps the two most fundamental ways of interpreting information. You can break the whole into its components. Or you can weave the components into a whole. Both are essential to human reasoning. But they are guided by different parts of the brain. Roger Sperry noted this key difference in a paper he wrote (with Jerre Levy-Agresti) in 1968:

> The data indicate that the mute, minor [right] hemisphere is specialized for Gestalt perception, being primarily a synthesist in dealing with information input. The speaking, major hemisphere, in contrast, seems to operate in a more logical, analytic computer-like fashion. Its language is inadequate for the rapid complex syntheses achieved by the minor hemisphere.[14]

The left converges on a single answer; the right diverges into a Gestalt. The left focuses on categories, the right on relationships. The left can grasp the details. But only the right hemisphere can see the big picture.

All of which leads back to those brain scans.

Fear and Loathing in My Amygdalas

Toward the base of the brain sit two almond-shaped structures that serve as the brain's Department of Homeland Security.[15] They're called the amygdalas—and they play a crucial role in processing emotions, especially fear. With one located in the left hemisphere and the other in the right, the amygdalas are ever on the lookout for threats in our midst. Not surprisingly, when I was inside the MRI machine looking at pictures of upset people and unsettling scenes, my amygdalas issued alerts. But which amygdala—left or right—sounded the warning differed considerably depending on which images I was viewing.

As the brain scans later revealed, when I looked at the faces, both of my amygdalas activated—but the right was much more active than the left. When I looked at the scenes, the left was more active than the right. This turns out to be consistent with what we know about the two sides of the brain.

Why did the left side respond more actively to scenes than to faces? Because accurately assessing each scene depended on the rapid-fire sequential reasoning at which the left hemisphere excels. Consider the photo on page 12 and the chain of logic it unfurled: *This is a gun. Guns are dangerous. He's pointing a gun at me. This is a scary situation.* So my left amygdala leaps from its chair, breaks the glass, and pulls the alarm. By contrast, the left amygdala was relatively quiet (though not entirely inactive) when I viewed the faces. That's because the right hemisphere, as countless studies have shown, is specialized both for recognizing faces and for interpreting expressions. Those skills depend not on sequential, analytic reasoning—we don't look at the eyes, then the nose, then the teeth—but on the ability to interpret the parts of the face simultaneously and to synthesize those details into a larger conclusion.

There are also other reasons for my differing responses. Understanding that a man pointing a pistol represents a threat is something we've *learned.* According to Ahmad Hariri, the neuroscientist who headed this portion of the NIH project I participated in, the response to such images is "likely learned through experience and social transmission and, thus, may be derived from, if not dependent on, responses in the left hemisphere brain regions."[16] If I were to show that image to someone who'd never seen a gun, and therefore had never learned that they were dangerous, the reaction might be bewilderment rather than fear. But if I showed the face on page 10 to someone who'd never seen a Caucasian woman, or perhaps had never encountered anyone outside of his own village, he'd still likely be able to identify the expression. In fact, that is precisely what University of California, San Francisco, professor Paul Ekman, who developed this set of images (called the Facial Action Coding System) and whom we'll meet in Chapter 7, has found in thirty-five years of research testing these expressions with subjects ranging from college students to remote tribes in New Guinea: "There has never been an instance in which the majority in two cultures ascribes a different emotion to the same expression."[17]

My brain, then, is not merely ordinary in its looks. It is also ordinary in its actions. Both sides work together—but they have different specialties. The left hemisphere handles logic, sequence, literalness, and analysis. The right takes care of synthesis, emotional expression, context, and the big picture.

A Whole New Mind

There are two kinds of people in the world, an old joke goes: those who believe that everything can be divided into two categories—and the rest of you. Human beings somehow seem naturally inclined to see life in contrasting pairs. East versus West. Mars versus Venus. Logic versus emotion. Left versus right. Yet, in most realms we usually don't have to pick sides—and it's often dangerous if we do. For instance, logic without emotion is a chilly, Spock-like existence. Emotion without logic is a weepy, hysterical world where the clocks are never right and the buses always late. In the end, yin always needs yang.

This is especially true when it comes to our brains. The two sides work in concert—two sections of an orchestra that sounds awful if one side packs up its instruments and goes home. As McManus puts it:

> However tempting it is to talk of right and left hemispheres in isolation, they are actually two half-brains, designed to work together as a smooth, single, integrated whole in one entire, complete brain. The left hemisphere knows how to handle logic and the right hemisphere knows about the world. Put

> the two together and one gets a powerful thinking machine. Use either on its own and the result can be bizarre or absurd.[18]

In other words, leading a healthy, happy, successful life depends on both hemispheres of your brain.

But the contrast in how our cerebral hemispheres operate does yield a powerful *metaphor* for how individuals and organizations navigate their lives. Some people seem more comfortable with logical, sequential, computer-like reasoning. They tend to become lawyers, accountants, and engineers. Other people are more comfortable with holistic, intuitive, and nonlinear reasoning. They tend to become inventors, entertainers, and counselors. And these individual inclinations go on to shape families, institutions, and societies.

Call the first approach *L-Directed Thinking.* It is a form of thinking and an attitude to life that is characteristic of the left hemisphere of the brain—sequential, literal, functional, textual, and analytic. Ascendant in the Information Age, exemplified by computer programmers, prized by hardheaded organizations, and emphasized in schools, this approach is directed *by* left-brain attributes, *toward* left-brain results. Call the other approach *R-Directed Thinking.* It is a form of thinking and an attitude to life that is characteristic of the right hemisphere of the brain—simultaneous, metaphorical, aesthetic, contextual, and synthetic. Underemphasized in the Information Age, exemplified by creators and caregivers, shortchanged by organizations, and neglected in schools, this approach is directed *by* right-brain attributes, *toward* right-brain results.*

*Because very few things human beings do are governed exclusively by one hemisphere or the other, I've chosen the terms "L-Directed" and "R-Directed" instead of the more convenient "left-brain thinking" and "right-brain thinking." This is not a book about neuroscience, of course. It's a book that uses neuroscience to create a metaphor. But even (perhaps especially) in the realm of metaphor, it's important to be true to the science.

Of course, we need both approaches in order to craft fulfilling lives and build productive, just societies. But the mere fact that I feel obliged to underscore that obvious point is perhaps further indication of how much we've been in the thrall of reductionist, binary thinking. Despite those who have deified the right brain beyond all scientific evidence, there remains a strong tilt toward the left. Our broader culture tends to prize L-Directed Thinking more highly than its counterpart, taking this approach more seriously and viewing the alternative as useful but secondary.

But this is changing—and it will dramatically reshape our lives. Left-brain-style thinking used to be the driver and right-brain-style thinking the passenger. Now, R-Directed Thinking is suddenly grabbing the wheel, stepping on the gas, and determining where we're going and how we'll get there. L-Directed aptitudes—the sorts of things measured by the SAT and deployed by CPAs—are still necessary. But they're no longer sufficient. Instead, the R-Directed aptitudes so often disdained and dismissed—artistry, empathy, taking the long view, pursuing the transcendent—will increasingly determine who soars and who stumbles. It's a dizzying—but ultimately inspiring—change. And in the next chapter, I'll explore the reasons why it's happening.