

MINDSIGHT

.....

The New Science of Personal Transformation

DANIEL J. SIEGEL, M.D.



BANTAM BOOKS

CONTENTS

Foreword by Daniel Goleman

Introduction: *Diving into the Sea Inside*

PART I • THE PATH TO WELL-BEING: *Mindsight Illuminated*

1 • A Broken Brain, a Lost Soul: *The Triangle of Well-Being*
Minding the Brain: *The Brain in the Palm of Your Hand*

2 • Crepes of Wrath: *Mindsight Lost and Found*
Minding the Brain: *Neuroplasticity in a Nutshell*

3 • Leaving the Ether Dome: *Where Is the Mind?*
Minding the Brain: *Riding the Resonance Circuits*

4 • The Complexity Choir: *Discovering the Harmony of Health*

PART II • THE POWER TO CHANGE: *Mindsight in Action*

5 • A Roller-Coaster Mind: *Strengthening the Hub of Awareness*

6 • Half a Brain in Hiding: *Balancing Left and Right*

7 • Cut Off from the Neck Down: *Reconnecting the Mind and the Body*

8 • Prisoners of the Past: *Memory, Trauma, and Recovery*

9 • Making Sense of Our Lives: *Attachment and the Storytelling Brain*

10 • Our Multiple Selves: *Getting in Touch with the Core*

11 • The Neurobiology of “We”: *Becoming Advocates for One Another*

12 • Time and Tides: *Confronting Uncertainty and Mortality*

Epilogue • *Widening the Circle: Expanding the Self*

Acknowledgments

Appendix

INTRODUCTION

Diving into the Sea Inside

WITHIN EACH OF US there is an internal mental world—what I have come to think of as the sea inside—that is a wonderfully rich place, filled with thoughts and feelings, memories and dreams, hopes and wishes. Of course it can also be a turbulent place, where we experience the dark side of all those wonderful feelings and thoughts—fears, sorrows, dreads, regrets, nightmares. When this inner sea seems to crash in on us, threatening to drag us down below to the dark depths, it can make us feel as if we are drowning. Who among us has not at one time or another felt overwhelmed by the sensations from within our own minds? Sometimes these feelings are just a passing thing—a bad day at work, a fight with someone we love, an attack of nerves about a test we have to take or a presentation we have to give, or just an inexplicable case of the blues for a day or two. But sometimes they seem to be something much more intractable, so much part of the very essence of who we are that it may not even occur to us that we can change them. This is where the skill that I have called “mindsight” comes in, for mindsight, once mastered, is a truly transformational tool. Mindsight has the potential to free us from patterns of mind that are getting in the way of living our lives to the fullest.

WHAT IS MINDSIGHT?

Mindsight is a kind of focused attention that allows us to see the internal workings of our own minds. It helps us to be aware of our mental processes without being swept away by them, enables us to get ourselves off the autopilot of ingrained behaviors and habitual responses, and moves us beyond the reactive emotional loops we all have a tendency to get trapped in. It lets us “name and tame” the emotions we are experiencing, rather than being overwhelmed by them. Consider the difference between saying “I am sad” and “I feel sad.” Similar as those two statements may seem, there is actually a profound difference between them. “I am sad” is a kind of self-definition, and a very limiting

one. “I feel sad” suggests the ability to recognize and acknowledge a feeling, without being consumed by it. The focusing skills that are part of mindfulness make it possible to see what is inside, to accept it, and in the accepting to let it go, and, finally, to transform it.

You can also think of mindfulness as a very special lens that gives us the capacity to perceive the mind with greater clarity than ever before. This lens is something that virtually everyone can develop, and once we have it we can dive deeply into the mental sea inside, exploring our own inner lives and those of others. A uniquely human ability, mindfulness allows us to examine closely, in detail and in depth, the processes by which we think, feel, and behave. And it allows us to reshape and redirect our inner experiences so that we have more freedom of choice in our everyday actions, more power to create the future, to become the author of our own story. Another way to put it is that mindfulness is the basic skill that underlies everything we mean when we speak of having social and emotional intelligence.

Interestingly enough, we now know from the findings of neuroscience that the mental and emotional changes we can create through cultivation of the skill of mindfulness are transformational at the very physical level of the brain. By developing the ability to focus our attention on our internal world, we are picking up a “scalpel” we can use to resculpt our neural pathways, stimulating the growth of areas of the brain that are crucial to mental health. I will talk a lot about this in the chapters that follow because I believe that a basic understanding of how the brain works helps people see how much potential there is for change.

But change never just happens. It’s something we have to work at. Though the ability to navigate the inner sea of our minds—to have mindfulness—is our birthright, and some of us, for reasons that will become clear later, have a lot more of it than others, it does not come automatically, any more than being born with muscles makes us athletes. The scientific reality is that we need certain experiences to develop this essential human capacity. I like to say that parents and other caregivers offer us our first swimming lessons in that inner sea, and if we’ve been fortunate enough to have nurturing relationships early in life, we’ve developed the basics of mindfulness on which we can build. But even if such early support was lacking, there are specific activities

and experiences that can nurture mind-sight throughout the lifespan. As you will see, mindsight is a form of expertise that can be honed in each of us, whatever our early history.

When I first began to explore the nature of the mind professionally, there was no term in our everyday language that captured the way we perceive our thoughts, feelings, sensations, memories, beliefs, attitudes, hopes, dreams, and fantasies. Of course, these activities of the mind fill our day-to-day lives—we don't need to learn a skill in order to experience them. But how do we actually develop the ability to perceive a thought—not just have one—and to know it as an activity of our minds so that we are not taken over by it? How can we be receptive to the mind's riches and not just reactive to its reflexes? How can we direct our thoughts and feelings rather than be driven by them? And how can we know the minds of others, so that we truly understand “where they are coming from” and can respond more effectively and compassionately? When I was a young psychiatrist, there weren't many readily accessible scientific or even clinical terms to describe the whole of this ability. To be able to help my patients, I coined the term *mindsight* so that together we could discuss this important ability that allows us to see and shape the inner workings of our own minds.

Our first five senses allow us to perceive the outside world—to hear a bird's song or a snake's warning rattle, to make our way down a busy street or smell the warming earth of spring. What has been called our sixth sense allows us to perceive our internal bodily states—the quickly beating heart that signals fear or excitement, the sensation of butterflies in our stomach, the pain that demands our attention. Mindsight, our ability to look within and perceive the mind, to reflect on our experience, is every bit as essential to our well-being. Mindsight is our seventh sense.

As I hope to show you in this book, this essential skill can help us build social and emotional brainpower, move our lives from disorder to well-being, and create satisfying relationships filled with connection and compassion. Business and government leaders have told me that understanding how the mind functions in groups has helped them be more effective and enabled their organizations to become more productive. Clinicians in medicine and mental health have said that

mindsight has changed the way they approach their patients, and that putting the mind at the heart of their healing work has helped them create novel and useful interventions. Teachers introduced to mindsight have learned to “teach with the brain in mind” and are reaching and teaching their students in deeper and more lasting ways.

In our individual lives, mindsight offers us the opportunity to explore the subjective essence of who we are, to create a life of deeper meaning with a richer and more understandable internal world. With mindsight we are better able to balance our emotions, achieving an internal equilibrium that enables us to cope with the small and large stresses of our lives. Through our ability to focus attention, mindsight also helps the body and brain achieve homeostasis—the internal balance, coordination, and adaptiveness that forms the core of health. Finally, mindsight can improve our relationships with our friends, colleagues, spouses, and children—and even the relationship we have with our own selves.

A NEW APPROACH TO WELL-BEING

Everything that follows rests on three fundamental principles. The first is that mindsight can be cultivated through very practical steps. This means that creating well-being—in our mental life, in our close relationships, and even in our bodies—is a learnable skill. Each chapter of this book explores these skills, from basic to advanced, for navigating the sea inside.

Second, as mentioned above, when we develop the skill of mindsight, we actually change the physical structure of the brain. Developing the lens that enables us to see the mind more clearly stimulates the brain to grow important new connections. This revelation is based on one of the most exciting scientific discoveries of the last twenty years: How we focus our attention shapes the structure of the brain. Neuroscience supports the idea that developing the reflective skills of mindsight activates the very circuits that create resilience and well-being and that underlie empathy and compassion as well. Neuroscience has also definitively shown that we can grow these new connections throughout our lives, not just in childhood. The short *Minding the Brain* sections interspersed through out [part 1](#) are a traveler’s guide to this new

territory.

The third principle is at the heart of my work as a psychotherapist, educator, and scientist. Well-being emerges when we create connections in our lives—when we learn to use mindsight to help the brain achieve and maintain *integration*, a process by which separate elements are linked together into a working whole. I know this may sound both unfamiliar and abstract at first, but I hope you'll soon find that it is a natural and useful way of thinking about our lives. For example, integration is at the heart of how we connect to one another in healthy ways, honoring one another's differences while keeping our lines of communication wide open. Linking separate entities to one another—integration—is also important for releasing the creativity that emerges when the left and right sides of the brain are functioning together.

Integration enables us to be flexible and free; the lack of such connections promotes a life that is either rigid or chaotic, stuck and dull on the one hand or explosive and unpredictable on the other. With the connecting freedom of integration comes a sense of vitality and the ease of well-being. Without integration we can become imprisoned in behavioral ruts—anxiety and depression, greed, obsession, and addiction.

By acquiring mindsight skills, we can alter the way the mind functions and move our lives toward integration, away from these extremes of chaos or rigidity. With mindsight we are able to focus our mind in ways that literally integrate the brain and move it toward resilience and health.

MINDSIGHT MISUNDERSTOOD

It's wonderful to receive an email from an audience member or patient who says, "My whole view of reality has changed." But not everyone new to mindsight gets it right away. Some people are concerned that it's just another way to become more self-absorbed—a form of navel-gazing, of becoming preoccupied with "reflection" instead of living fully. Perhaps you've also read some of the recent research (or the ancient wisdom) that tells us that happiness depends on "getting out of

yourself.” Does mindsight turn us away from this greater good? While it is true that being self-obsessed decreases happiness, mindsight actually frees you to become less self-absorbed, not more. When we are not taken over by our thoughts and feelings, we can become clearer in our own internal world as well as more receptive to the inner world of another. Scientific studies support this idea, revealing that individuals with more mindsight skills show more interest and empathy toward others. Research has also clearly shown that mindsight supports not only internal and interpersonal well-being but also greater effectiveness and achievement in school and work.

Another quite poignant concern about mindsight came up one day when I was talking with a group of teachers. “How can you ask us to have children reflect on their own minds?” one teacher said to me. “Isn’t that opening a Pandora’s box?” Recall that when Pandora’s box was opened, all the troubles of humanity flew out. Is this how we imagine our inner lives or the inner lives of our children? In my own experience, a great transformation begins when we look at our minds with curiosity and respect rather than fear and avoidance. Inviting our thoughts and feelings into awareness allows us to learn from them rather than be driven by them. We can calm them without ignoring them; we can hear their wisdom without being terrified by their screaming voices. And as you will see in some of the stories in this book, even surprisingly young children can develop the ability to pause and make choices about how to act when they are more aware of their impulses.

HOW DO WE CULTIVATE MINDSIGHT?

Mindsight is not an all-or-nothing ability, something you either have or don’t have. As a form of expertise, mindsight can be developed when we put in effort, time, and practice.

Most people come into the world with the brain potential to develop mindsight, but the neural circuits that underlie it need experiences to develop properly. For some—such as those with autism and related neurological conditions—the neural circuits of mind-sight may not develop well even with the best caregiving. In most children, however, the ability to see the mind develops through everyday interactions with

others, especially through attentive communication with parents and caregivers. When adults are in tune with a child, when they reflect back to the child an accurate picture of his internal world, he comes to sense his own mind with clarity. This is the foundation of mindsight. Neuroscientists are now identifying the circuits of the brain that participate in this intimate dance and exploring how a caregiver's attunement to the child's internal world stimulates the development of those neural circuits.

If parents are unresponsive, distant, or confusing in their responses, however, their lack of attunement means that they cannot reflect back to the child an accurate picture of the child's inner world. In this case, research suggests, the child's mindsight lens may become cloudy or distorted. The child may then be able to see only part of the sea inside, or see it dimly. Or the child may develop a lens that sees well but is fragile, easily disrupted by stress and intense emotions.

The good news is that whatever our early history, it is never too late to stimulate the growth of the neural fibers that enable mindsight to flourish. You'll soon meet a ninety-two-year-old man who was able to overcome a painful and twisted childhood to emerge a mindsight maven. Here we see living evidence for another exciting discovery of modern neuroscience: that the brain never stops growing in response to experience. And this is true for people with happy childhoods, too. Even if we had positive relationships with our care-givers and parents early on—and even if we write books on the subject—we can continue as long as we live to keep developing our vital seventh sense and promoting the connections and integration that are at the heart of well-being.

We'll begin our journey in [part 1](#) by exploring situations in which the vital skills of mindsight are absent. These stories reveal how seeing the mind clearly and being able to alter how it functions are essential elements in the path toward well-being. [Part 1](#) is the more theoretical section of the book, where I explain the basic concepts, give readers an introduction to brain science, and offer working definitions of the mind and mental health. Since I know that my readers will come from a wide variety of backgrounds and interests, I realize that some of you may

want to skim or even skip much of that material in order to move directly to [part 2](#). In [part 2](#), we'll dive deeply into stories from my practice that illustrate the steps involved in developing the skills of [mindsight](#). This is the section of the book in which I share the knowledge and practical skills that will help people understand how to shape their own minds toward health. At the very end of the book is an appendix outlining the fundamental concepts and a set of endnotes with the scientific resources supporting these ideas.

Our exploration of [mindsight](#) begins with the story of a family that changed my own life and my entire approach to psychotherapy. Looking for ways to help them inspired me to search for new answers to some painful questions about what happens when [mindsight](#) is lost. It also led to my search for the techniques that can enable us to reclaim and recreate [mindsight](#) in ourselves, our children, and our communities. I hope you'll join me on this journey into the inner sea. Within those depths awaits a vast world of possibility.

PART I



**THE PATH TO WELL-BEING:
*MINDSIGHT ILLUMINATED***

A BROKEN BRAIN, A LOST SOUL
The Triangle of Well-Being

BARBARA'S FAMILY MIGHT NEVER HAVE COME for therapy if seven-year-old Leanne hadn't stopped talking in school. Leanne was Barbara's middle child, between Amy, who was fourteen, and Tommy, who was three. They had all taken it hard when their mother was in a near-fatal car accident. But it wasn't until Barbara returned home from the hospital and rehabilitation center that Leanne became "selectively mute." Now she refused to speak with anyone outside the family—including me.

In our first weekly therapy sessions, we spent our time in silence, playing some games, doing pantomimes with puppets, drawing, and just being together. Leanne wore her dark hair in a single jumbled ponytail, and her sad brown eyes would quickly dart away whenever I looked directly at her. Our sessions felt stuck, her sadness unchanging, the games we played repetitive. But then one day when we were playing catch, the ball rolled to the side of the couch and Leanne discovered my video player and screen. She said nothing, but the sudden alertness of her expression told me her mind had clicked on to something.

The following week Leanne brought in a videotape, walked over to the video machine, and put it into the slot. I turned on the player and her smile lit up the room as we watched her mother gently lift a younger Leanne up into the air, again and again, and then pull her into a huge, enfolding hug, the two of them shaking with laughter from head to toe. Leanne's father, Ben, had captured on film the dance of communication between parent and child that is the hallmark of love: We connect with each other through a give-and-take of signals that link us from the inside out. This is the joy-filled way in which we come to share each other's minds.

Next the pair swirled around on the lawn, kicking the brilliant yellow and burnt-orange leaves of autumn. The mother-daughter duet approached the camera, pursed lips blowing kisses into the lens, and then burst out in laughter. Five-year-old Leanne shouted, "Happy birthday, Daddy!" at the top of her lungs, and you could see the camera

shake as her father laughed along with the ladies in his life. In the background Leanne's baby brother, Tommy, was napping in his stroller, snuggled under a blanket and surrounded by plush toys. Leanne's older sister, Amy, was off to the side engrossed in a book.

"That's how my mom used to be when we lived in Boston," Leanne said suddenly, the smile dropping from her face. It was the first time she had spoken directly to me, but it felt more like I was overhearing her talk to herself. Why had Leanne stopped talking?

It had been two years since that birthday celebration, eighteen months since the family moved to Los Angeles, and twelve months since Barbara suffered a severe brain injury in her accident—a head-on collision. Barbara had not been wearing her seat belt that evening as she drove their old Mustang to the local store to get some milk for the kids. When the drunk driver plowed into her, her forehead was forced into the steering wheel. She had been in a coma for weeks following the accident.

After she came out of the coma, Barbara had changed in dramatic ways. On the videotape I saw the warm, connected, and caring person that Barbara had been. But now, Ben told me, she "was just not the same Barbara anymore." Her physical body had come home, but Barbara herself, as they had known her, was gone.

During Leanne's next visit I asked for some time alone with her parents. It was clear that what had been a close relationship between Barbara and Ben was now profoundly stressed and distant. Ben was patient and kind with Barbara and seemed to care for her deeply, but I could sense his despair. Barbara just stared off as we talked, made little eye contact with either of us, and seemed to lack interest in the conversation. The damage to her forehead had been repaired by plastic surgery, and although she had been left with motor skills that were somewhat slow and clumsy, she actually looked quite similar, in outward appearance, to her image on the videotape. Yet something huge had changed inside.

Wondering how she experienced her new way of being, I asked Barbara what she thought the difference was. I will never forget her reply: "Well, I guess if you had to put it into words, I suppose I'd say that

I've lost my soul.”

Ben and I sat there, stunned. After a while, I gathered myself enough to ask Barbara what losing her soul felt like.

“I don't know if I can say any more than that,” she said flatly. “It feels fine, I guess. No different. I mean, just the way things are. Just empty. Things are fine.”

We moved on to practical issues about care for the children, and the session ended.

A DAMAGED BRAIN

It wasn't clear yet how much Barbara could or would recover. Given that only a year had passed since the accident, much neural repair was still possible. After an injury, the brain can regain some of its function and even grow new neurons and create new neural connections, but with extensive damage it may be difficult to retrieve the complex abilities and personality traits that were dependent on the now destroyed neural structures.

Neuroplasticity is the term used to describe this capacity for creating new neural connections and growing new neurons in response to experience. Neuroplasticity is not just available to us in youth: We now know that it can occur throughout the lifespan. Efforts at rehabilitation for Barbara would need to harness the power of neuroplasticity to grow the new connections that might be able to reestablish old mental functions. But we'd have to wait awhile for the healing effects of time and rehabilitation to see how much neurological recovery would be possible.

My immediate task was to help Leanne and her family understand how someone could be alive and look the same yet have become so radically different in the way her mind functioned. Ben had told me earlier that he did not know how to help the children deal with how Barbara had changed; he said that he could barely understand it himself. He was on double duty, working, managing the kids' schedules, and making up for what Barbara could no longer do. This was a mother who had delighted in making homemade Halloween costumes and Valentine's

Day cupcakes. Now she spent most of the day watching TV or wandering around the neighborhood. She could walk to the grocery store, but even with a list she would often come home empty-handed. Amy and Leanne didn't mind so much that she cooked a few simple meals over and over again. But they were upset when she forgot their special requests, things they'd told her they liked or needed for school. It was as if nothing they said to her really registered.

As our therapy sessions continued, Barbara usually sat quietly, even when she was alone with me, although her speech was intact. Occasionally she'd suddenly become agitated at an innocent comment from Ben, or yell if Tommy fidgeted or Leanne twirled her ponytail around her finger. She might even erupt after a silence, as if some internal process was driving her. But most of the time her expression seemed frozen, more like emptiness than depression, more vacuous than sad. She seemed aloof and unconcerned, and I noticed that she never spontaneously touched either her husband or her children. Once, when three-year-old Tommy climbed onto her lap, she briefly put her hand on his leg as if repeating some earlier pattern of behavior, but the warmth had gone out of the gesture.

When I saw the children without their mother, they let me know how they felt. "She just doesn't care about us like she used to," Leanne said. "And she doesn't ever ask us anything about ourselves," Amy added with sadness and irritation. "She's just plain selfish. She doesn't want to talk to anyone anymore." Tommy remained silent. He sat close to his father with a drawn look on his face.

Loss of someone we love cannot be adequately expressed with words. Grappling with loss, struggling with disconnection and despair, fills us with a sense of anguish and actual pain. Indeed, the parts of our brain that process physical pain overlap with the neural centers that record social ruptures and rejection. Loss rips us apart.

Grief allows you to let go of something you've lost only when you begin to accept what you now have in its place. As our mind clings to the familiar, to our established expectations, we can become trapped in feelings of disappointment, confusion, and anger that create our own internal worlds of suffering. But what were Ben and the kids actually letting go of? Could Barbara regain her connected way of being? How

could the family learn to live with a person whose body was still alive, but whose personality and “soul”—at least as they had known her—were gone?

“YOU-MAPS” AND “ME-MAPS”

Nothing in my formal training—whether in medical school, pediatrics, or psychiatry—had prepared me for the situation I now faced in my treatment room. I’d had courses on brain anatomy and on brain and behavior, but when I was seeing Barbara’s family, in the early 1990s, relatively little was known about how to bring our knowledge of such subjects into the clinical practice of psychotherapy. Looking for some way to explain Barbara to her family, I trekked to the medical library and reviewed the recent clinical and scientific literature that dealt with the regions of the brain damaged by her accident.

Scans of Barbara’s brain revealed substantial trauma to the area just behind her forehead; the lesions followed the upper curve of the steering wheel. This area, I discovered, facilitates very important functions of our personality. It also links widely separated brain regions to one another—it is a profoundly integrative region of the brain.

The area behind the forehead is a part of the frontal lobe of the cerebral cortex, the outermost section of the brain. The frontal lobe is associated with most of our complex thinking and planning. Activity in this part of the brain fires neurons in patterns that enable us to form neural representations—“maps” of various aspects of our world. The maps resulting from these clusters of neuronal activity serve to create an image in our minds. For example, when we take in the light reflected from a bird sitting in a tree, our eyes send signals back into our brain, and the neurons there fire in certain patterns that permit us to have the visual picture of the bird.

Somehow, in ways still to be discovered, the physical property of neurons firing helps to create our subjective experience—the thoughts, feelings, and associations evoked by seeing that bird, for example. The sight of the bird may cause us to feel certain emotions, to hear or remember its song, and even to associate that song with ideas such as

nature, hope, freedom, and peace. The more abstract and symbolic the representation, the higher in the nervous system it is created, and the more forward in the cortex.

The prefrontal cortex—the most damaged part of the frontal lobe of Barbara’s brain—makes complex representations that permit us to create concepts in the present, think of experiences in the past, and plan and make images about the future. The prefrontal cortex is also responsible for the neural representations that enable us to make images of the mind itself. I call these representations of our mental world “mindsight maps.” And I have identified several kinds of mindsight maps made by our brains.

The brain makes what I call a “me-map” that gives us insight into ourselves, and a “you-map” for insight into others. We also seem to create “we-maps,” representations of our relationships. Without such maps, we are unable to perceive the mind within ourselves or others. Without a me-map, for example, we can become swept up in our thoughts or flooded by our feelings. Without a you-map, we see only others’ behaviors, the physical aspect of reality, without sensing the subjective core, the inner mental sea of others. It is the you-map that permits us to have empathy. In essence, the injury to Barbara’s brain had created a world without mindsight. She had feelings and thoughts, but she could not represent them to herself as activities of her mind. Even when she said she’d “lost her soul,” her statement had a bland, factual quality, more like a scientific observation than a deeply felt expression of personal identity. (I was puzzled by that disconnect between observation and emotion until I learned from later studies that the parts of our brain that create maps of the mind are distinct from those that enable us to observe and comment on self-traits such as shyness or anxiety—or, in Barbara’s case, the lack of a quality she called “soul.”)

In the years since I took Barbara’s brain scans to the library, much more has been discovered about the interlinked functions of the prefrontal cortex. For example, the side of this region is crucial for how we pay attention; it enables us to put things in the “front of our mind” and hold them in awareness. The middle portion of the prefrontal area, the part damaged in Barbara, coordinates an astonishing number of essential skills, including regulating the body, attuning to others,

balancing emotions, being flexible in our responses, soothing fear, and creating empathy, insight, moral awareness, and intuition. These were the skills Barbara was no longer able to recruit in her interactions with her family.

I will be referring to—and expanding on—this list of nine middle prefrontal functions throughout our discussion of mindsight. But even at first glance, you can see that these functions are essential ingredients for well-being, ranging from bodily processes such as regulating our hearts to social functions such as empathy and moral reasoning.

After Barbara emerged from her coma, her impairments had seemed to settle into a new personality. Some of her habits, such as what she liked to eat and how she brushed her teeth, remained the same. There was nothing significantly changed in how her brain mapped out these basic behavioral functions. But the ways in which she thought, felt, behaved, and interacted with others were profoundly altered. This affected every detail of daily life—right down to Leanne’s crooked ponytail. Barbara still had the behavioral moves necessary to fix her daughter’s hair, but she no longer cared enough to get it right.

Above all, Barbara seemed to have lost the very map-making ability that would enable her to honor the reality and importance of her own or others’ subjective inner lives. Her mindsight maps were no longer forming amid the now-jumbled middle prefrontal circuitry upon which they depended for their creation. This middle prefrontal trauma had also disrupted the communication between Barbara and her family—she could neither send nor receive the connecting signals enabling her to join minds with the people she had loved most.

Ben summed up the change: “She is gone. The person we live with is just not Barbara.”

A TRIANGLE OF WELL-BEING: MIND, BRAIN, AND RELATIONSHIPS

The videotape of Ben’s birthday had revealed a vibrant dance of communication between Barbara and Leanne. But now there was no dance, no music keeping the rhythm of two minds flowing into a sense of a “we.” Such joining happens when we attune to the internal shifts in

another person, as they attune to us, and our two worlds become linked as one. Through facial expressions and tones of voice, gestures and postures—some so fleeting they can be captured only on a slowed-down recording—we come to “resonate” with one another. The whole we create together is truly larger than our individual identities. We feel this resonance as a palpable sense of connection and aliveness. This is what happens when our minds meet.

A patient of mine once described this vital connection as “feeling felt” by another person: We sense that our internal world is shared, that our mind is *inside* the other. But Leanne no longer “felt felt” by her mom.

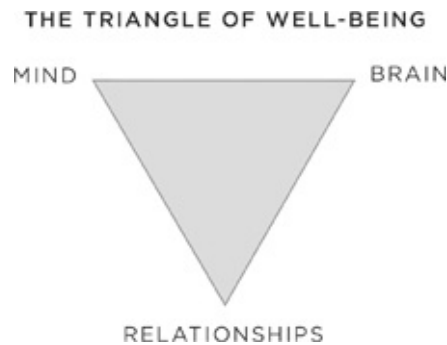
The way Barbara behaved with her family reminded me of a classic research tool used to study infant-parent communication and attachment. Called the “still-face” experiment, it is painful both to participate in and to watch.

A mother is asked to sit with her four-month-old infant facing her and when signaled, to stop interacting with her child. This “still” phase in which no verbal or nonverbal signals are to be shared with the child is profoundly distressing. For up to three minutes, the child attempts to engage the now-nonresponsive parent in a bid for connection. At first the child usually amps up her signals, increasing smiles, coos, eye contact. But after a period of continuing nonre-sponse, she becomes agitated and distressed, her organized bids for connection melting into signs of anguish and outrage. She may then attempt to soothe herself by placing her hand in her mouth or pulling at her clothes. Sometimes researchers or parents call off the experiment at this time, but sometimes it goes on until the infant withdraws, giving up in a kind of despondent collapse that looks like melancholic depression. These stages of protest, self-soothing, and despair reveal how much the child depends upon the attuned responses of a parent to keep her own internal world in equilibrium.

We come into the world wired to make connections with one another, and the subsequent neural shaping of our brain, the very foundation of our sense of self, is built upon these intimate exchanges between the infant and her caregivers. In the early years this interpersonal regulation is essential for survival, but throughout our lives we continue to need such connections for a sense of vitality and well-being.

Leanne once had an attuned mother, and Barbara's earlier presence in her life was now literally embedded in the structure of Leanne's mindsight-map-making brain. But Barbara could no longer map Leanne's mind, she could not feel her children within her, and she could not make them "feel felt." Her lack of interest in them, her apparent indifference to their feelings and needs, her withdrawal of what they experienced as love, was the outer sign of this inner tragedy.

Treating Barbara's family made it clear to me that mind, brain, and relationships are not separate elements of life—they are irreducible aspects of one interconnected triangle of well-being. At seven years of age, Leanne had responded to her mother's withdrawal by going mute. The triangle was ruptured.



SEEING CLEARLY, LETTING GO, LETTING IN

I met with Leanne, Amy, Tommy, and Ben many times to give them an opportunity to talk openly to me and one another about how their lives had changed since Barbara's accident. Then one day I brought in Barbara's brain scans and pointed to the areas that had been damaged. I made simplified sketches on a whiteboard so that they could visualize the varied connections of the prefrontal cortex, and I let them know that the injury to this key region could explain almost all of the ways in which Barbara had changed. This seemed particularly important because children so often feel guilty when things go bad in a family. Here was concrete evidence that their mother's irritability and lack of warmth toward them were not caused by anything they had done and could not be remedied by their behaving "better." I hoped that instead of becoming paralyzed with self-recrimination or confusion, they could

make sense of the change in their lives and experience directly the pain of their loss.

The children listened as attentively as Ben did, and even Tommy seemed to grasp that his mother had a “broken brain.” Leanne had already become much more talkative during our meetings, and now she asked many questions about why her mom’s love needed a brain to become “alive.” “I thought love came from the heart,” she said. She was right: The networks of nerve cells around the heart and throughout the body communicate directly with the social parts of our brain and they send that heartfelt sense right up to our middle prefrontal areas. I told Leanne that unless her mother’s brain was working properly, she couldn’t pick up the signals that I was sure were still there in her heart. That image seemed to soothe Leanne, and she came back to it later again and again. It gave her a new patience and tolerance for her mother’s distant and irritable way of being, and I was touched to see her quiet acts of kindness toward Barbara. Leanne began talking again in school, reconnected with her friends, and found comfort in her teacher, who paid extra attention to her after hearing what had happened at home.

I met with Ben separately and encouraged him to express his own feelings more openly. This did not come naturally to him, and he had been working hard to keep family life as “normal” as possible. But of course their life wasn’t normal, and the children needed to see that they were not alone in their grief, that it was okay for them to express their fears and concerns and uncertainties. Ben and I also discussed Tommy’s particular needs. He had in essence lost his mother at two, before his own prefrontal region had begun to blossom. Not yet having developed the circuitry to express his feelings fully, Tommy especially would need ongoing help to make sense of his life’s story. For now, at three, his sadness, anxiety, and confusion were almost beyond words.

Amy continued to struggle with her anger toward her mother. She was furious that Barbara had not worn a seat belt that day and frustrated that the mother she’d once looked up to was now gone. In addition, at the very time when she was starting to move away from her family and find her own identity with friends, she was expected to take care of Leanne and Tommy. I heard her frustration, and I helped Ben acknowledge her need to have time for herself even while still being

expected to pitch in at home. Gradually she became able to treat her mother with more kindness, although Barbara could not reciprocate and treat Amy that way. This was their new reality.

As time went on, Barbara's motor coordination improved somewhat, but the damage to the front of her brain had been too severe, and she showed no signs of regaining her connected way of being. Nonetheless, Leanne and her family continued to strengthen their connections with one another. Mindsight permitted them to make sense of their experience and to allow the grieving process to unfold in a healthy way. Mindsight is what Barbara had lost—and mind-sight was what the family needed to mourn the old Barbara and let the new Barbara into their lives.

I learned then that knowing about the different functions of the brain somehow enables people to gain enough distance from a damaged or hurtful relationship that they can develop more compassion and understanding, both for the other person in the relationship and for themselves. As you will see throughout this book, this lesson has guided my work as a therapist ever since.

• • • • •

MINDING THE BRAIN

The Brain in the Palm of Your Hand

MINDSIGHT DEPENDS UPON LINKING together wide arrays of neural input—from throughout the entire body, from multiple regions of the brain, and even from the signals we receive from other people. To understand how this linkage takes place, it helps to be able to visualize the brain as a system of interconnected parts.

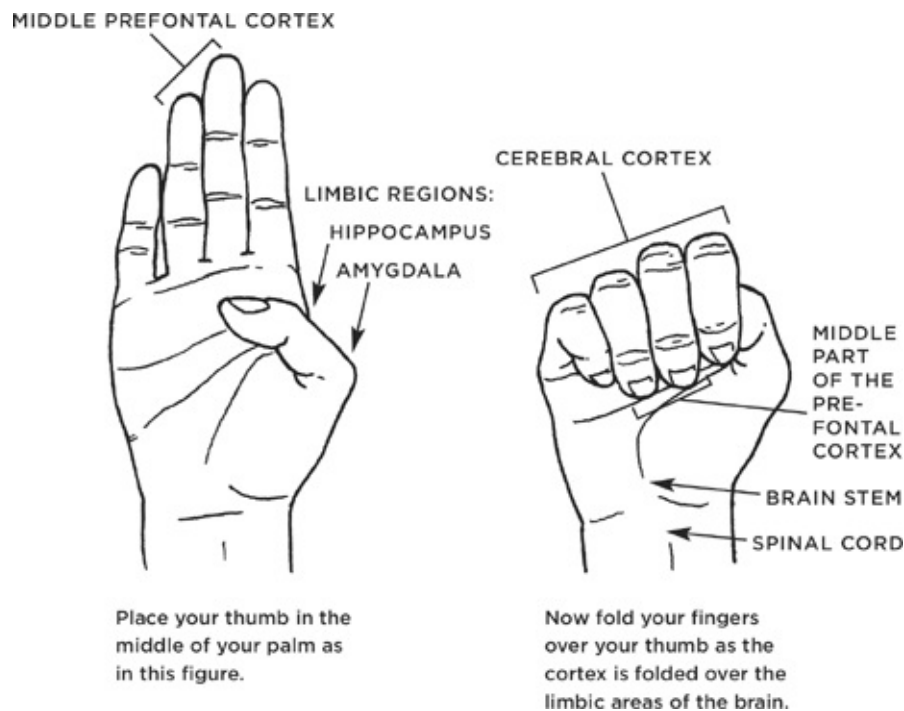
Since the time when I first sketched Barbara’s prefrontal regions for Leanne and the rest of her family, I’ve experimented with a number of models that show the brain in three dimensions. Following is the one I’ve never forgotten to take with me to a lecture. You can use it as you read this book without even getting up from your chair. Of course it’s simplified enough to make some neurologists eager for more details, but it has helped many of my patients develop the mindsight needed to make sense of their experiences.

HAND MODEL OF THE BRAIN

If you put your thumb in the middle of your palm and then curl your fingers over the top, you’ll have a pretty handy model of the brain. (My kids can’t stand that pun, either.) The face of the person is in front of the knuckles, the back of the head toward the back of your hand. Your wrist represents the spinal cord, rising from your backbone, upon which the brain sits. If you lift up your fingers and raise your thumb, you’ll see the inner brainstem represented in your palm. Place your thumb back down and you’ll see the approximate location of the limbic area (ideally we’d have two thumbs, left and right, to make this a symmetric model). Now curl your fingers back over the top, and your cortex is in place.

These three regions—the brainstem, the limbic area, and the cortex—comprise what has been called the “triune” brain, which developed in layers over the course of evolution. At a very minimum, integrating the brain involves linking the activity of these three regions. Since they are

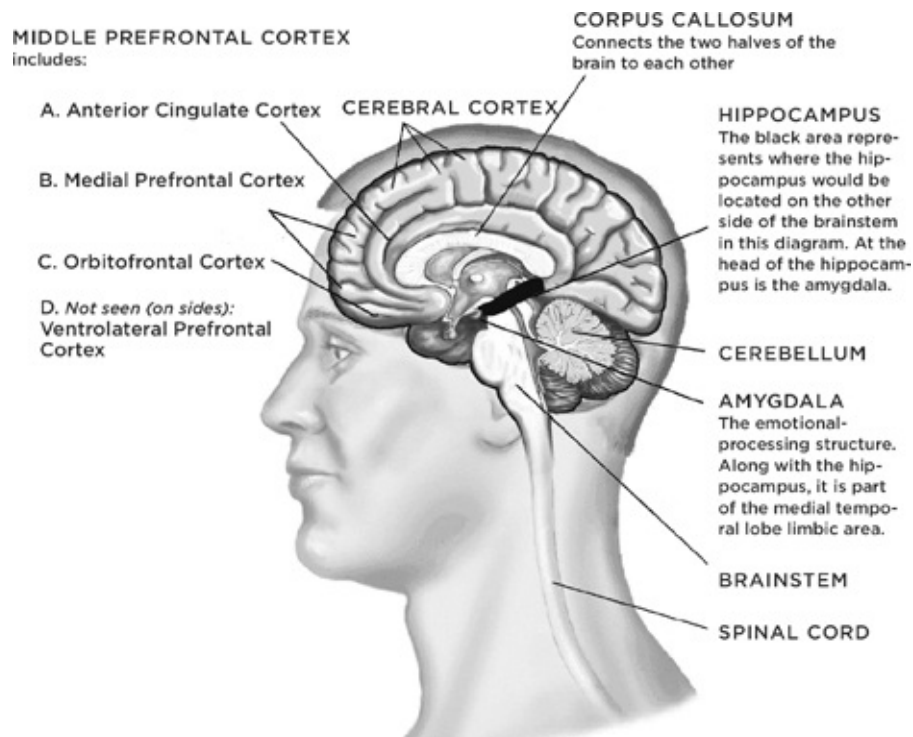
distributed bottom to top—from the inward and lower brainstem region, to the limbic area, to the outer and higher cortex—we could call this “vertical integration.” The brain is also divided into two halves, left and right, so neural integration must also involve linking the functions of the two sides of the brain. This could be called “horizontal” or “bilateral integration.” (I’ll discuss bilaterality in [chapter 6](#).) Knowing about the functions of the major regions of the brain can help you to focus your attention in ways that will create the desired linkage among them. So allow me to give you a brief overview of the layers of the triune brain.



THE BRAINSTEM

Hundreds of millions of years ago, the brainstem formed what some call the “reptilian brain.” The brainstem receives input from the body and sends input back down again to regulate basic processes such as the functioning of our heart and lungs. Beyond controlling the energy levels of the body through regulating heart rate and respiration, the brainstem also shapes the energy levels of the brain areas above it, the limbic and cortical regions. The brainstem directly controls our states of arousal, determining, for example, if we are hungry or satiated, driven by sexual

desire or relaxed with sexual satisfaction, awake or asleep.



A diagram of the human brain looking from the middle to the right side. Some of the major areas of the brain are indicated, including the brainstem, the limbic areas (with the amygdala and hippocampus), and the cerebral cortex (with the middle prefrontal regions). Not seen is the ventrolateral prefrontal cortex.

Clusters of neurons in the brainstem also come into play when certain conditions seem to require a rapid mobilization of energy distribution throughout the body and brain. This so-called fight-flight-freeze array of responses is responsible for our survival at times of danger. Working in concert with the evaluative processes of both the limbic and the higher cortical regions, the brainstem is the arbiter of whether we respond to threats either by mobilizing our energy for combat or for flight, or by freezing in helplessness, collapsing in the face of an overwhelming situation. But whichever of these responses is chosen, when we are in survival mode our reactivity makes it quite challenging, if not outright impossible, to be open and receptive to others. So part of the process of developing mind-sight involves reducing reactivity when it's not actually necessary, as you will see later.

The brainstem is also a fundamental part of what are called “motivational systems” that help us satisfy our basic needs for food, shelter, reproduction, and safety. When you feel a deep “drive” to behave in a certain way, chances are that your brainstem is working closely with the next-higher region, the limbic area, to push you to act.

THE LIMBIC REGIONS

The limbic area lies deep within the brain, approximately where your thumb is on the hand model. It evolved when small mammals first appeared around two hundred million years ago. This “old mammalian brain” works closely with the brainstem and the body proper to create not only our basic drives but also our emotions. These feeling states are filled with a sense of meaning because the limbic regions evaluate our current situation. “Is this good or is this bad?” is the most basic question the limbic area addresses. We move toward the good and withdraw from the bad. In this way the limbic regions help create the “e-motions” that “evoke motion,” that motivate us to act in response to the meaning we assign to whatever is happening to us in that moment.

The limbic area is also crucial for how we form relationships and become emotionally attached to one another. If you’ve ever raised fish, or frogs, or lizards, you know that these nonmammalian creatures lack attachment to you—and to one another. Rats, cats, and dogs, on the other hand, are equipped with a mammalian limbic region. Attachment is just what they—and we—do. We are hardwired to connect with one another thanks to our mammalian heritage.

The limbic area plays an important regulatory role through the hypothalamus, a master endocrine control center. Via the pituitary gland, the hypothalamus sends and receives hormones throughout the body—especially influencing our sexual organs and the thyroid and adrenal glands. For example, when we are stressed we secrete a hormone that stimulates the adrenals to release cortisol, which mobilizes energy by putting our entire metabolism on high alert to meet the challenge. This response is highly adaptive in the face of short-term stress, but it can turn into a problem in the long term. If we face an overwhelming situation in which we cannot adequately cope, cortisol levels may

become chronically elevated. Traumatic experiences, in particular, can sensitize limbic reactivity, so that even minor stresses can cause cortisol to spike, making daily life more challenging for the traumatized person. These high cortisol levels can also be toxic to the growing brain and interfere with proper growth and function of neural tissue. Finding a way to soothe excessively reactive limbic firing is crucial to rebalancing emotions and diminishing the harmful effects of chronic stress. As we'll see, mindsight can help us recruit the higher areas of the brain to create a "cortical override" of these limbic reactivities.

The limbic area also helps us create several different forms of memory—of facts, of specific experiences, of the emotions that gave color and texture to those experiences. Located to either side of the central hypothalamus and pituitary, two specific clusters of neurons have been intensively studied in this regard: the amygdala and the hippocampus. The almond-shaped amygdala has been found to be especially important in the fear response. (Although some writers attribute all emotions to the amygdala, more recent research suggests that our general feelings actually originate from more broadly distributed areas of the limbic zone, the brainstem, and the body proper, and are woven into our cortical functioning as well.)

The amygdala can prompt an instantaneous survival response. Once, when my son and I were hiking in the High Sierra, a sudden jolt of fear brought me to a halt and I yelled out to him, "Stop!" Only after I yelled did I realize why—my constantly on-guard amygdala had seized upon a visual perception, beneath my conscious awareness, of a coiled object in our path. Luckily my son did stop (he wasn't yet a resistant teenager) and was then able to step around the poised-for-action young rattlesnake who was sharing the trail with us. Here we see that emotional states can be created without consciousness, and we may act on them without awareness. This may save our lives—or it can cause us to do things we later regret deeply. In order for us to become aware of the feelings inside us—to consciously attend to and understand them—we need to link these sub-cortically created emotional states to our cortex.

Finally we come to the hippocampus, a sea horse-shaped cluster of neurons that functions as a master "puzzle-piece-assembler," linking together widely separated areas of the brain—from our perceptual

regions to our repository for facts to our language centers. This integration of neural firing patterns converts our moment-to-moment experiences into memories. I can relate the snake story to you because my hippocampus linked together the various aspects of that experience—sensations in my body, emotions, thoughts, facts, reflections—into a lived-in-time set of recollections.

The hippocampus develops gradually during our early years and continues to grow new connections and even new neurons throughout our lives. As we mature, the hippocampus weaves the basic forms of emotional and perceptual memory into factual and autobiographical recollections, laying the foundation for my ability to tell you about that long-ago snake encounter in the Sierras. However, this uniquely human storytelling ability also depends upon the development of the highest part of the brain, the cortex.

THE CORTEX

The outer layer, or “bark,” of the brain is the cortex. It is sometimes called the “new mammalian” brain or neocortex because it expanded greatly with the appearance of primates—and most especially with the emergence of human beings. The cortex creates more intricate firing patterns that represent the three-dimensional world beyond the bodily functions and survival reactions mediated by the lower, subcortical regions. In humans, the more elaborate frontal portion of the cortex allows us to have ideas and concepts and to develop the mindsight maps that give us insight into the inner world. The frontal cortex actually makes neural firing patterns that represent its own representations. In other words, it allows us to think about thinking. The good news is that this gives us humans new capacities to think—to imagine, to recombine facts and experiences, to create. The burden is that at times these new capacities allow us to think too much. As far as we know, no other species represents its own neural representations—probably one reason why we sometimes call ourselves “neurotic.”

The cortex is folded into convoluted hills and valleys, which brain scientists have divided into regions they call lobes. On your hand model, the back or posterior cortex extends from your second knuckle (counting

from the fingertips) to the back of your hand, and includes the occipital, parietal, and temporal lobes. The posterior cortex is the master mapmaker of our physical experience, generating our perceptions of the outer world—through the five senses—and also keeping track of the location and movement of our physical body through touch and motion perception. If you’ve learned to use a tool—whether it was a hammer, a baseball bat, or even a car—you may remember the magical moment when your initial awkwardness dropped away. The amazingly adaptive perceptual functions of the back of the cortex have embedded that object into your body-maps so that it is neurally experienced like an extension of your body. This is how we can drive rapidly on a freeway or park a car in a tight space, use a scalpel with precision, or attain a .300 batting average.

Looking again at your hand model, the front of the cortex, or frontal lobe, extends from your fingertips to the second knuckle. This region evolved during our primate history and is most developed in our human species. As we move from the back toward the front, we first encounter a “motor strip” that controls our voluntary muscles. Distinct groups of neurons control our legs, arms, hands, fingers, and facial muscles. These neural groups extend to the spinal cord, where they cross over, so that we make our right-side muscles work by activating our left motor area. (The same crossover is true for our sense of touch, which is represented farther back in the brain, in a zone of the parietal lobe called the “somatosensory strip.”) Coming back to the frontal area and moving a bit more forward, we find a region called the “premotor” strip, which allows us to plan our motor actions. You can see that this part of the frontal lobe is still deeply connected to the physical world, enabling us to interact with our external environment.

THE PREFRONTAL CORTEX

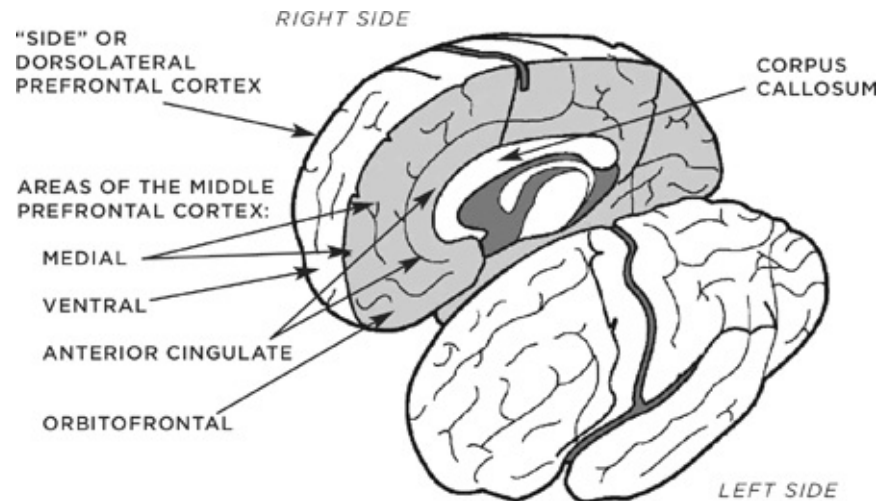
As we move higher and more forward in the brain, we finally come to the area from your first knuckles to your fingertips on the hand model. Here, just behind the forehead, is the prefrontal cortex, which has evolved to this extent only in human beings. We have now moved beyond the neural concerns for the physical world and the movement of

the body and into another realm of neurally constructed reality. Beyond the bodily and survival concerns of the brainstem, beyond the evaluative and emotional limbic functions, beyond even the perceptual processes of the posterior cortex and the motor functions of the posterior portion of the frontal lobe, we come upon the more abstract and symbolic forms of information flow that seem to set us apart as a species. In this prefrontal realm, we create representations of concepts such as time, a sense of self, and moral judgments. It is here also that we create our mindsight maps.

Look again at your hand model. The outer two fingertips represent the side prefrontal cortex, which participates in generating the conscious focus of attention. When you put something in the “front of your mind” you are linking activity in this region to activity from other areas of the brain, such as the ongoing visual perceptions from the occipital lobe. (Even when we generate an image from memory, we activate a similar portion of that occipital lobe.) When my amygdala perceived the rattlesnake without my conscious awareness, that perceptual “shortcut” likely took place without my side prefrontal involvement. Only later, after I’d yelled for my son to stop and felt my heart pounding, did my side prefrontal region get involved and permit me to figure out, consciously, that I’d been afraid of a snake.

Now focus on the middle two fingernail areas. We have arrived at the middle prefrontal area that was so severely damaged in Barbara’s accident. As I described earlier in this chapter, this area has important regulatory functions that range from shaping bodily processes—through overseeing brainstem activity—to enabling us to pause before we act, have insight and empathy, and enact moral judgments.

What makes this middle prefrontal region so crucial to carrying out these essential functions of a healthy life? If you lift your fingers up and put them back down, you’ll get a sense of the anatomical uniqueness of this region: It connects everything. Notice how your two middle fingertips rest on top of the limbic-thumb and touch the brainstem-palm, and are also linked directly to the cortex-fingers. So the middle prefrontal area is literally one synapse away from neurons in the cortex, the limbic area, and the brainstem. And, as I’ll discuss later, it even has functional pathways that connect us to the social world of other brains.



The two halves of the brain. This figure reveals the locations of the areas of the middle prefrontal cortex, which includes the medial and ventral regions of the prefrontal cortex, the orbitofrontal cortex, and the anterior cingulate cortex on both sides of the brain. The corpus callosum connects the two halves.

The middle prefrontal region creates links among the following widely separated and differentiated neural regions: the cortex, limbic areas, and brainstem within the skull, and the internally distributed nervous system of the body proper. It also links signals from all those areas to the signals we send and receive in our social world. As the prefrontal cortex helps coordinate and balance the firing patterns from these many regions, it is profoundly integrative.

In the following chapter we'll explore what happens when this integrative area goes off-line. Lift up your fingers and you'll have an image of how we "flip our lids" and head down the "low road" in our interactions with others.