MINDSIGHT

Dan Siegel offers therapists a new vision of the brain

by Mary Sykes Wylie

In 1999, a few months after child psychiatrist Daniel Siegel's book The Developing Mind: Toward a Neurobiology of Interpersonal Experience was published, Siegel received an e-mail, purporting to be from a representative of Pope John Paul II, asking him to come to the Vatican to talk to the Pope. Thinking the e-mail was a prank, Siegel ignored it—why would the Pope invite an expert on the neurobiology of childhood attachment over to the Vatican to schmooze? Nevertheless, one enigmatic detail of the message stuck in Siegel's mind as he deleted it: the Pope, according to the message, wanted very much to know why "the mother's gaze" was so critical to the growth and emotional well-being of a baby.

As it turned out, the e-mail was legitimate. An official letter soon followed from the Pontifical Council for the Family, formally inviting Siegel to be the main speaker at a Vatican conference for church leaders and Catholic social services providers and missionaries, to be followed by a private Papal audience for Siegel and his family. Siegel accepted the invitation with one caveat: he wanted the Pope to know ahead of time that the all-important loving gaze could come from either parent or from another attachment figure—it didn't have to originate with the mother.

Reading John Paul's biography before he left for Rome, Siegel discovered something he thought might explain the Pope's request. When John Paul was asked by the biographer if he remembered much about his mother, who had died when he was a young child, he said no at first. Then, a bit later, he backed up, saying he did recall one thing—"I remember my mother's gaze." Could the Pope want Siegel to explain what happened in the brain that made this ephemeral moment in the life of a young boy still resonate, like a lost dream, many decades later in the heart and mind of a frail, elderly man?

What drew the Pope to Siegel's work was apparently the search for some illumination about the small, everyday miracle of that gaze—what novelist George Eliot called "the meeting eyes of love"—that every child yearns for and must have, literally, to survive. Repeated tens of thousands of times in the child's life, these small moments of mutual rapport serve to transmit the best part of our humanity—our capacity for love—from one generation to the next.

For many therapists, what Siegel has done is to show just how, from the moment we're born, our most important relationships fire into being the neural circuits of the brain that allow us to understand and empathize with others and feel their feelings. But beyond that, he's gone on to link his interest in both science and the nuance of relationship with the almost unfathomable complexities of neuroscience to generate a field he calls "interpersonal neurobiology," which has brought the latest findings of brain science directly into the therapist's consulting room. As much as any figure in the mental health field, he's taken on, as both a professional challenge and a personal quest, the task of showing his clinician colleagues how the objective, physical matter of the brain—its lobes, modules, folds, lumps, tubes, and fibers—creates the possibilities for the subjective life of the mind, heart, soul, and spirit that is the glory of our species.

While still only 47 and not a formal brain researcher himself—certainly not the originator of the massive, accumulating body of theory regarding the processes of human attachment— Siegel has displayed a unique ability as a synthesizer, weaving together strands of knowledge from a variety of fields. Through his highly influential book and hundreds of workshop presentations

he's given around the globe in recent years, he's tried to bridge the previously disconnected worlds of neuroscience research and clinical practice. "Dan is the right person at the right time," says Pat Love, a noted couples therapist and workshop presenter who's devoted the past several years to integrating neuroscience into her own clinical work. "His work cuts across disciplinary lines to bring together neuroscience, developmental theory, evolutionary psychology, systems theory, psychiatry, medicine, and psychotherapy and point us toward the integrated thinking that will shape the future of our field."

Siegel is by no means the first clinician to have talked about the role of attachment and brain processes in clinical work. For more than 50 years, attachment theory has been a significant feature on the landscape of childhood development research. But until recently, how attachment research might inform knowledge about adult psychology was virtually ignored by psychotherapists. For example, Los Angeles psychologist Marion Solomon recalls traveling with a group of associates to England in the early 1980s to visit pioneering attachment researcher John Bowlby and enthusiastically bringing back tapes of his works. When she returned, however, she found that "no one was interested in considering the clinical implications of attachment theory. They just weren't buying the ideas." According to Solomon, however, "There's something about the way Dan has put this material together that makes the lights go on for people. He's propelled attachment theory and neuroscience beyond the tipping point within the therapy world."

Considered a tour de force by reviewers from the worlds of clinical and research psychology and psychiatry, The Developing Mind—a densely packed synthesis of childhood attachment research, cognitive science, the study of emotion, and complexity theory—has definitely established Siegel's credentials as a major expositor and interpretor of neuroscience esoterica to nonspecialists. But even the book's critical success doesn't, in itself, explain the excitement he's been able to generate within the field. After all, it's a daunting read that probably won't be chosen anytime soon for the Oprah book club.

Explaining Siegel's impact, students and colleagues again and again cite the distinctive personal electricity he conveys. "Dan is a born connector," says Marion Solomon, "whether it's one-to-one or with an audience of thousands." His friend Alan Schore, known for his groundbreaking research and theoretical work on childhood attachment, still remembers his first meeting with Siegel 10 years ago at a dinner party. "We just started talking, and before I knew it I was intellectually and emotionally in synch with him," recalls Schore. "The only other person with whom I'd ever clicked like that was my wife."

"Even if you're listening to him in a large audience, you have the sense that Dan is speaking directly to you," adds Schore. That seems to be part of the mesmerizing effect that Siegel's public lectures have. Take the 2003 Psychotherapy Networker Symposium at which Siegel delivered a 45-minute keynote loaded with high-end neurospeak, sprinkled with references to the orbitofrontal cortex, anterior cigulate, hippocampus, the intricacies of neural transmission, synaptic plasticity. and gene expression. Clearly, it wasn't the kind of thing calculated to electrify an early-morning crowd. But from the first moments of his talk, when the soft-spoken, boyish-looking Siegel, apparently dressed by L.L. Bean, ambled on stage without notes to address an audience of 3,000, he had the mostly neuroscientifically challenged crowd on the edge of their chairs with enthusiasm.

Hundreds of shoulders in the hall palpably relaxed as he drew a laugh admitting that, as a medical student, the task of trying to remember the multisyllabic names for different brain parts "made me nauseous." Like a class of born-again biology fans, the crowd happily imitated Siegel

as he repeatedly referred to his “hand puppet” model of the brain—balled fist, with knuckles representing the prefrontal cortex and the middle of the palm standing in for the brain stem. “Dan can take complicated ideas and put them into everyday language,” says Marion Solomon. “He just conveys a driving curiosity that’s irresistible to audiences.”

It isn’t just Siegel’s skill as a communicator that enables him to connect so well with an audience, but the message he brings about the nature of the brain. Most of us who had any exposure at all to the human (rather than, say, the frog) brain in our biology classes were taught about the “single-skull” version. Translating his thorny subject for nonspecialists, Siegel enthralls audiences with his vision of the brain as an exquisitely social organ. From birth, it’s not the relentless unfolding of a genetic plan that determines the shape of our adult minds, Siegel explains, but what happens between different brains that largely shapes what happens inside our individual brains. He opens up unexplored vistas of a plastic, self-renewing brain, with capacities to rewire itself in response to changing circumstances that go well beyond assumptions about our innate, hardwired limitations prevalent in neuroscience circles until only a few years ago.

For those inspired by the synthesis Siegel offers, his contribution transcends a particular concept or a set of change techniques. “In recent years, the therapy field has been dominated by theoretical eclecticism and a lot of attention to techniques and practical interventions, as if you can believe anything you want theoretically,” says Sue Johnson, an originator of Emotionally-Focused Couples Therapy, one of the most empirically supported marital therapy approaches. “What Dan Siegel has done is give us a bridge to science and a much clearer idea about the organizing brain structure of relationships,” adds Pat Love. “For the first time, Siegel is offering a neuroscientific paradigm for understanding how all kinds of psychotherapy work. He’s taking us beyond anecdotes and metaphors and vague theories and ‘it-works-because-I-say-so’ into a measurable science of human nature.”

DSM ‘n Drugs

But the ability to connect disparate disciplines didn’t come easily. Soon after enrolling at Harvard Medical School in 1978, the young Siegel, still unsure of his own career path, found himself plunged into a professional culture focused on diseases and pathologies. It jarred him to listen to doctors and his fellow medical students refer to patients as isolated body parts—“I saw an incredible kidney today,” or “There’s a very interesting liver in room 415.” He soon found himself regularly being dressed down for spending too much time listening to his patients’ stories. “If you want to listen to people’s stories, go to social work school—that’s not what doctors do!” one irate supervisor told him.

Disillusioned, he dropped out of med school and spent a vagabond year considering various “careers,” including professional dancing, carpentry, documentary filmmaking, and salmon fishing. It was a fellow fisherman who turned Siegel away from that particular career choice, pointing out that fishing was all about “getting up at 3 a.m, bending over the side of a freezing boat for hours, your back killing you, throwing fishhooks out and pulling them in until your hands are too crippled to do much else.” This de facto career advisor told Siegel that he himself was quitting fishing and going back to graduate school in psychology, and that Siegel should go back to medical school. Soon after that, working on a film interview of a man writing a book about the left and right sides of the brain, Siegel had a mini career epiphany and decided he, too, was fascinated by the brain and the mind. But since it would have taken him too long to get the credits he needed for psychology graduate school, he decided to return to medical school at Harvard and focus on psychiatry.

Academic psychiatry during the ’80s, it turned out, was exactly the wrong place for someone eager to develop a holistic, integrated view of the mind and brain. An increasingly reductionistic biological (i.e. psychopharmaceutical) psychiatry had just begun its relentless push for dominance. With the advent of DSM III and the torrent of new medications pouring out of the pharmaceutical pipeline, psychiatry grew ever more inclined to define emotional and mental problems as purely medical illnesses reflecting biochemical imbalances in the brain. Diagnosis became a game of parsing DSM categories and subcategories, and treatment a matter of prescribing meds to amp up or dampen down the synaptic exchange of neurotransmitters. The last thing that interested these scientist-psychiatrists was a vaporous, 19th-century concept like mind. “There was no understanding that subjective human experience—feelings—was an objective scientific reality,” recalls Siegel. “Psychiatrists were supposed to be experts on the brain, and all they were interested in was knowing how neurons fire—they weren’t interested in feelings.”

Siegel found the emerging infatuation with the DSM ‘n Drugs combo deeply distasteful and a betrayal of what he considered the deeper mission of psychiatry. “I hated to see colleagues and trainees seeing patients for half an hour for a meds check, then sending them off until their next appointment three months later,” he says. For him, the self-conscious scientism of the new psychiatry was a crabbed, distorted version of real scientific inquiry: “The only brain mechanisms we ever really talked about were neurotransmitter receptors.”

One case from this frustrating period that underscored biological psychiatry’s lack of imagination sticks in Siegel’s mind. He was seeing a young woman in therapy who was suffering from unresolved grief and guilt at the loss of a parent. Eventually, she got better, and when she was ready to leave, Siegel asked her what had been most helpful about her treatment. She thought for a minute and then said, “When I’m with you, I feel felt.” Her remark about what is a perfectly commonplace experience in good therapy contrasted for Siegel with the indifference to relationship that he saw all around him. “She could see that my inner emotional state was affected by her inner emotional state, and that profoundly changed her experience of herself, which gave her hope that she could change.” But the scientist in Siegel also wanted to know what exactly the objective brain mechanisms were that resulted in this profoundly healing interpersonal experience.

At the time, the psychiatry department at Harvard was a war zone of mutually antagonistic factions, each speaking its own language, sunk in its own pet paradigms (biological psychiatry, psychoanalytic psychiatry, descriptive psychiatry, social psychiatry) who, Siegel recalls, “all bad-mouthed each other.” But whatever his feelings about the shortcomings of biological psychiatry, the field of psychotherapy offered little attraction for Siegel. Its most influential models didn’t exhibit the barest interest in neurobiology or, in his opinion, even a decent regard for ordinary intellectual consistency. And despite his humanistic inclinations, he still wanted a disciplined, scientifically plausible explanation of the core phenomena therapists dealt with—human personality, emotion, memory, and identity. But none of the “explanations” offered by various psychiatric denominations, or the deceptively-neat DSM taxonomy, actually explained anything to him. Siegel regarded them as “ever more complicated definitions of observations—they all seemed about as substantial as plumes of smoke.”

It seemed to Siegel that any explanation worth its salt must incorporate both the biological and the personal; it must somehow include the physical brain, the individual story of the particular human being, and the evolutionary story of the whole species. It had to reflect the tough-minded objectivity of science and the “soft” subjectivity of ordinary human experience. Neither

“scientific” psychiatry, which reduced an individual to the ebb and flow of brain chemistry, nor a Tower of Babel of contending psychotherapies, which completely ignored the living brain, even came close to meeting these apparently impossible goals.

No Axe to Grind

During the late ’80s, Siegel found something approaching the kind of theoretical connective tissue he was looking for when he discovered attachment theory. In the previous 40-odd years, attachment researchers following the pioneering work of John Bowlby and Mary Ainsworth had built up a formidable body of empirical research to show that a young child’s sense of security, safety, and well-being depends largely upon the emotional quality of his relationship with his primary caregivers. And it was this secure base in early childhood, the theory continued, that enabled a child to grow into an emotionally stable adult and become a good parent to his or her own children.

For Siegel, attachment researchers, with their careful attention to measurement and moment-by-moment interaction, “seemed beautifully nonpartisan and unbiased, without any clinical or theoretical axe to grind.” He also found in attachment theory something he’d missed in other explanatory models—a rigorously scientific field that focused on something more emotionally compelling than the synaptic vicissitudes of neurotransmitters. Here was a field that posed the most fundamental questions about the small miracle by which we actually become human beings: How does a coherent sense of self emerge from the turmoil of fluctuating sensations that is a baby’s mind? How does early experience shape our personalities? How do we learn to love? Why do we tend to treat our children the way we were treated? Why does parenting matter?

In 1988, Siegel heard one of the pioneers of attachment theory, Mary Main, give a talk about her work on what she called “coherent narrative.” Main and her colleagues had devised an instrument called the Adult Attachment Interview (AAI), in which parents were asked about their recollections of their own childhoods. What Main’s research indicated was that the way these parents told their own stories—how they made sense of their past lives, or didn’t—was the most powerful predictor (85 percent accuracy) of whether their own children would be securely attached to them. If adults could create a reflective, coherent, and emotionally-rich narrative about their own childhoods, they were likely to form a good, secure relationship with their children—no matter how “insecurely attached” they themselves had been as children or how inadequate or even abusive their own parents were. It wasn’t what happened to them as children, but how they came to make sense of what happened to them that predicted their emotional integration as adults and what kind of parents they’d be.

The narrative material struck Siegel “like a lightning bolt,” extending attachment research beyond the nonverbal attunement of “the mother’s gaze” into the realm of memory and language. As much as we need the wordless love and the creaturely comfort of our parents and caregivers, we also need to acquire the ability—the mental and emotional wherewithal—to put our experience into words in order to fulfill our biological potential as human beings. For Siegel, the idea of narrative became the key to a bigger, more coherent, “story” than either psychiatry or psychology had so far been able to produce. “Anthropology shows us that every culture on earth tells stories. For the last 40,000 years we, as a species, have been trying to bring what’s inside of us out—to make sense of what we see and put it out there for other people to hear,” says Siegel. “Stories bring together the external, observable, objective world and our internal experience of our minds. The capacity and need to tell stories is not only part of our culture, but

part of our evolutionary heritage, built into our genetic code and embedded in the circuits of our brains."

Furthermore, the findings on narrative were a real beacon of hope, empirically reinforcing the commonsense notion that people can change—their lives are not determined by their bad beginnings. In fact, according to the attachment researchers, a person can earn her emotional security and ability to create a coherent narrative about her past through personal growth and involvement in positive, healthy relationships with teachers, friends, lovers, mates, and, of course, therapists. "I loved the way attachment research showed that fate (having less-than-perfect parents) isn't necessarily destiny," says Siegel. "If you can make sense of your story, you can change it."

Of course, most therapists share Siegel's interest in the transformative power of narrative, but not his need to ground his beliefs in scientific principle. For him, however, it was as if he'd opened one of a set of nested Chinese boxes—discovering one powerful explanatory system in the connection between narrative and attachment theory—only to come across another, smaller, but even more intriguing box. What, he wondered, were the neurobiological mechanisms that made attachment so important? How does coherent narrative "happen" in the brain?

Of Coherence and Incoherence

The question of how we develop a coherent narrative was becoming clinically relevant for Siegel because he had a number of patients with PTSD, and one of the most striking symptoms of his traumatized patients was their inability to construct a coherent story about their past. If asked to talk about what happened to them as children, they became disorganized and incoherent, couldn't remember major events of their own life histories, and frequently became emotionally distraught just making the effort to recall the past. These patients remembered traumatic incidents while in one state of mind and then had no memory of the same incident when in another state of mind. They confused the past and the present and experienced highly charged, intrusive flashbacks that didn't seem like "normal" declarative memories. To Siegel, there was clearly some connection between their traumatic past—what was called their "disorganized attachment"—and something going on in their brains that prevented them from making sense of their own stories.

As a clinician, Siegel knew that PTSD was assumed to be related to dissociation, but what did that mean? How could clients both not remember enough to tell a coherent story and at the same time remember all too much, all too vividly? Psychiatrists still described these symptoms in the archaic and inadequate language of psychoanalysis—conscious versus unconscious or repressed memory—which was too schematic and narrowly sectarian to make sense of phenomena that, literally, burst the bounds of standard theories and models.

To find some more promising answers, Siegel began studying neuroscience in earnest. While exploring the complexities of memory, he learned from some of the leading authorities in the research world about the fascinating difference between implicit and explicit memory, and the newly discovered role of a horn-shaped region of the brain called the hippocampus. Implicit memory is a form of nonverbal, unconscious memory, present at birth, which lays down neural pathways encoding emotion (via the amygdala), behavioral patterns, and learned habits (like driving), perceptions, and probably bodily memory. We may experience very strong feelings or body sensations triggered by an implicit memory, for example, but have no subjective awareness of consciously recalling anything—we just feel something powerful. About a year

after birth, the hippocampus comes online and begins to encode explicit memories, including consciously recalled facts—"Richard Wagner was married to Franz Liszt's daughter"—and the countless past experiences, feelings, and thoughts that make up our awareness of our autobiographical past.

Discovering the division between implicit and explicit memory and the role of the hippocampus in turning the former into the latter was, for Siegel, like finding a trail after hacking his way through a dense jungle. "The timing was wonderful, coming just when I was learning about attachment narratives and desperate to understand trauma," Siegel says. It dawned on him that the disruption of the hippocampus and the processing of explicit memory might have something to do with why both PTSD clients and "disorganized" parents in the attachment research couldn't relate a coherent story about the terrible past. What if trauma shut off the hippocampus, so that horrible sensations and experiences flooded the amygdala and were laid down as implicit memories, but were blocked from becoming explicit memories? That might explain the odd fact that people with PTSD experienced their memories in the here and now without having the sensation of remembering them. Today, this theory is old hat among trauma therapists and researchers (though still surprisingly unfamiliar to many other clinicians). Even so, however, when the discovery of what the hippocampus did was itself brand new, nobody seems to have made that connection.

Siegel first publicly floated his idea at a conference in 1992, attended by famous heavyweights from the trauma and neuroscience communities (including Eric Kandel, later winner of a Nobel prize for demonstrating how experience creates new neural connections in the brain). During one session, somebody in the audience asked, "How do you explain traumatic repression in terms of the brain?" Nobody had an answer. Siegel, still considered a junior colleague by many of the prominent figures in attendance, daringly raised his hand. "I was just this punk kid, but I threw out my idea—Is it possible that if the hippocampus is blocked during a trauma, you could be vulnerable to flashbacks and dissociation because, while you'd have the implicit memory of the event, you'd have no explicit, declarative memory of it?' Then I sat down."

At the break, an intrigued mob surrounded Siegel and asked him to amplify on this extremely interesting and radical idea of his. "It was the first experience I ever had of going to the brain to find out how people's mental processes work and coming up with an answer that might pave a way to better treatment," Siegel remembers.

Brain and Mind

Siegel was soon feverishly exploring anything else he could find out about how the brain worked and what light neurobiological research might shed on the problems of his patients. From 1991 to 1995, while the head of training in child psychiatry at UCLA, he led a study group, a multidisciplinary dream-team loaded with experts—anthropologists, evolutionary biologists, linguists, geneticists, psychiatrists, and heavily weighted with neuro-types, including neurobiologists, neurologists, and neurosurgeons. "I was realizing that the brain held the secrets to the mind," he says now.

He focused, for example, on the clinical implications of the fact that the right and left hemispheres work in dramatically different ways. By then it was commonly understood that the left brain is associated with logic, cause-effect reasoning, verbal processing, and linear thinking, while the right is associated with nonlinear, holistic (big-picture) thinking, intense emotion, body sense, social awareness, and nonverbal communication. What Siegel became interested in was that a coherent narrative about the past requires both hemispheres to be fully online: the right

holds the images, themes, and sense of personal self existing across time, while the left holds the drive to make logical meaning and put words to these wordless feeling states and perceptions. Right away, this seemed to explain the difficulties many people had in creating coherent narrative: if the two sides of the brain weren't working together, the story would either be chaotic and confused—overwhelming feeling, overwhelmed thought—or superficially logical but lacking the emotional oomph of a good, coherent autobiographical story

He decided to try out the theory that integrating brain function could be beneficial therapeutically with clients who had an impoverished sense of their own past and couldn't really feel or express emotion: "I'd worked out a hypothesis that this type of patient might respond to therapy that explicitly stimulated the development of the right hemisphere." And it worked. A lot of the patients, who usually intellectualized their way through talk therapy, responded very well to guided imagery, sensate-body focusing, and practice in using and picking up on nonverbal cues.

Simply telling patients what might be going on in their brains, he discovered, could also be both deeply comforting and therapeutic. He explained to patients with PTSD the difference between implicit and explicit memory and the function of the hippocampus, and they felt less crazy. "You're telling me I'm not nuts," said one greatly relieved patient, who thought she was going insane because of the flashbacks and intrusive images that hounded her. As she put it, "It's just that the bad things that happened to me got fragmented in my mind and were never put together into my regular memory by my hippowhatsis."

Soon, he was spiking his therapy with brief, neurobiological vignettes that helped clients understand why they were so prone to sudden rages, or had such rotten love lives, or felt so anxious all the time. Siegel became adept at explaining the role of the unbridled amygdala, the self-calming talents of the neocortex, the heroically integrative properties of the orbitofrontal cortex, the amazing system of mirror neurons that allows us to pick up and feel the feelings and intentions of others—the remarkable capacity for "mindsight." He even started keeping a chalkboard in his office to draw rough sketches of the brain and its parts, which helped ground discussions of subjective mental experience in the world of physical reality. "Unlike most psychological concepts, the brain is a three-dimensional object that you can hold in your hand," he says. "It's also a visual entity, and we're very visual creatures—a lot of our cortical real estate is devoted to vision. So when I sketch the brain on the board, people can really 'see' it."

His patients loved it. Far from making them feel that their lives were completely determined by physiological processes beyond their control, they felt empowered. They discovered that their negative feelings weren't them, but originated from one part of their brains, which could be controlled by another part, actually altered by what they think. "Connections in the brain shape the way you think, but the flip side is true, too," says Siegel. "The way you think can change your brain. Neural firing changes neural connections—if you pay attention." We often have the idea that we have no power to control our own attention. Not so. "You can harness the power of your mind," says Siegel. "You can sit in your prefrontal cortex, where self-regulation is mediated, and simply notice, just notice, the mental processes emanating from different neural circuits of the brain—without locking onto them."

By now, the concept of mindfulness—detached attention to one's own feelings and thoughts—has acquired the fuzzy quality of overfamiliarity among therapists, becoming something of a New Age platitude. But Siegel gives it a fresh dimension by grounding it in the realities of neurobiology. His interest is in how mindfulness works in the brain and how it can, literally, change brain function. "Mindfulness promotes the integrative function of the prefrontal

cortex," Siegel says. "It allows brain circuits to fire that have perhaps never fired before, giving people a sensation of inner awareness that they may never have had before." In short, it brings about neural changes that Siegel alternately calls "integration," "coherence," or "self-regulation."

At first glance, "self-regulation" is a mildly soporific term reminiscent of the psych lab, but from Siegel's perspective it defines the basic goal of all psychotherapy. "When you think about it, you can understand almost every mental health problem—anxiety, depression, eating disorders, personality disorders, thinking disorders—as an issue of self-regulation," Siegel remarks. Self-regulation, in the Siegel lexicon, is the balanced and integrated "flow of energy and information" through the major systems of the brain—brain stem, limbic circuits, neocortex, autonomic nervous system—and between one brain and another. When we're in this secure, stable state of mind-brain-body equilibrium, we can face life's vicissitudes with some measure of emotional calm, flexibility, self-awareness, and reason. Our relationships are good, and we're "mindful" almost as a matter of course.

But, according to Siegel, "self-regulation" is really something of a misnomer. What should by now be blindingly obvious is that our capacity for self-regulation depends so much upon our interactions with other people that it might well be called "other-regulated self- regulation." We're not born knowing how to regulate ourselves—in fact, we're alarmingly, chaotically, un-self-regulated creatures at birth, more so than most other newborn animals on earth. Loving parents, if we're lucky, begin the long process of teaching us how to organize and regulate our inner selves—encoding their care and attention in the pliable neural fibers that integrate various regions throughout our brains. No matter how good we had it in the beginning, however, we'll need reinforcement of these early lessons throughout life, and much remedial work if we were shortchanged early on.

For Siegel, therapists are the remedial attachment experts and rescuers of the chronically un-self-regulated, and it is their job to, in effect, help rewire the frayed neural connections, reintegrate (or sometimes integrate for the first time) different areas and functions of the brain—implicit and explicit memory, right and left hemisphere, neocortex with limbic system and brain stem. From Siegel's viewpoint of interpersonal neurobiology, here's how a therapist influences a distraught patient reliving a past traumatic event that hasn't yet been consolidated and turned into an ordinary memory.

Imagine you're such a patient sitting in your therapist's office. She sees that you're not in good shape—pale, shaky, agitated—and knows that your sympathetic nervous system is clearly running in overdrive. She listens to you try to explain what happened and realizes right away that your story isn't coherent—your left brain is struggling to make sense of this past event, but your words are being swamped by waves of intense right-hemisphere emotion. You stutter, forget things, swallow nervously, feel nauseated, and have to keep starting your story all over again. Something about what you're trying to say is still locked in your amygdala, in your implicit memory—still hasn't been processed by your hippocampus so it can become simply part of your explicit memory, and then incorporated into your consciously remembered autobiographical story. How can she help this neural integration happen?

Listening closely to you, your therapist lets you know that she's really there with you, she feels some of what you're feeling. She picks up your fear, confusion, despair, but without being overcome by them as you are. As a result, you "feel felt" through nonverbal signals and mirror neurons and you "see yourself" in her, allowing you to realize that you're authentically in her mind, and this changes your experience of the moment. You take a deep breath and feel a little

safer, more grounded, calmer, almost as if her strong, steady mind is embracing your fragmented, chaotic one.

Knowing the brain is an associational organ, your therapist tries to elicit what it was about the recent triggering experiences that might have reminded you of something from the past. She sees how the past event affects you in the present and she joins you in this mental time travel, carefully probing your past and your present life. This helps bring the two into a more stable, integrated relationship with each other—allowing you to put a past event in the past, so you can viscerally distinguish the present moment from it and move forward into the future without fear that it will continue to haunt you. By doing this, she helps you increase neural integration between differentiated areas of the brain—the consolidation of memory via the hippocampus into the neocortex, and the synthesis of left-brain logic and right-brain emotion, so that the past event becomes no more and no less than an aspect of your conscious autobiographical story.

And so it goes. With her as your guide, you go back and forth with her between mind and brain, using your capacity for conscious thought and reflection on the buzzing activity within that neural hive beneath your skull. And as you do so, your immediate experience—your sense of yourself and your story—gradually changes. You begin seeing the past event in the context of other events, other times, relationships past and present, and you can weave it into an ongoing narrative of your life. As the implicit memories from years back are turned into part of a more coherent and inclusive autobiographical story, you feel relieved, somehow lighter. You also feel deep gratitude and affection for your therapist, as you would for someone with whom you've been through a life-or-death struggle and emerged victorious. In a sense, nothing has changed— the past is still what it was—but everything has changed, because, in concert, your mind and this other sensitive, deeply attuned, intelligent mind have changed your brain. The gradual improvement in your capacity for "self-regulation" hasn't been a solo performance, but a duet sung in counterpoint.

Night Vision

For all his curiosity about the brain and its workings, Siegel professes himself largely indifferent to the subject of therapeutic technique. He doesn't seem to care particularly what methods therapists use, and consistently avoids telling them what they should do in treatment. "You can shape and harness synaptic connections in the brain by giving patients medications or doing therapy," he says. "You can also do it just by teaching them to meditate and get in touch with their bodies, go jogging, play music. Or you might use the fact that the self is defined by interpersonal communication to form reparative attachments with them." He doesn't even try very hard to sell the idea that all good therapists must know about neurobiology. "If you're doing great work, I suppose you probably don't need to know about the brain," he says. In fact, he readily admits that, at this stage, many of the tenets of interpersonal neurobiology remain hypotheses, not scientific fact. Nobody really knows what exactly is going on in the brain during therapy—how a clinical encounter or two or seventy actually affect synapse formation. But he's convinced—and has convinced many thousands of others—that learning about the brain and the power of relationship to create and change neural circuits is the most important challenge the therapy field will face in the years to come.

Forty years ago, family systems theory transformed psychotherapy by forcing clinicians to see beyond the single psyche to the interlocking circles of relationships that also make up the reality of the "individual" self. It might be said that Siegel's system brings into every therapy encounter an even bigger system, which includes the entire psychological, biological, and genetic history of the human species. This awareness of the fact that every human being contains multitudes

and carries within him- or herself a lineage extending back to the origins of life on this planet may not immediately change what a therapist does, but it almost certainly will change the way she understands her work and its impact on her patients. And as Pat Love says, describing the way neuroscience has transformed her own work, “Information is intervention.”

At this point, what Siegel offers therapists in his synthesis of evolutionary biology, neuroscience, and developmental psychology has more to do with a way of seeing than practical clinical advice. To explain the effect of this way of looking at ourselves and others, he likes to describe a walk he recently took on a deserted Oregon beach late one night, with his flashlight turned off. It took his eyes a while to to pick out of the darkness the vague outlines of rocks, the billions of stars, the serpentine border of the sea and sand. Unlike the familiar reality that we see by the light of day, the world revealed to us by this kind of night vision, he notes, can be disorienting, even surreal, possibly menacing, but often magical. We feel our capacities for perception sharpened and transformed as we become more attuned and attentive to the smallest, most subtle, variations of shape and shadow. In some way, by seeing less, we see more.

For Siegel, night vision is a metaphor for the world of subtle processes that interpersonal neurobiology opens up for our investigation. It awakens us to the everyday marvels of the human brain—our ability to transcend the quotidian boundaries of space and time, to “see” through the barrier of the physical body into the invisible precincts of another’s mind, conceive of imaginary worlds that never did and never could exist anywhere else except in the imagination—in short, to shatter the laws of ordinary reality. Interpersonal neurobiology not only gives us some idea of how these impossibilities really do happen in the physical world, it makes us more aware of them inside ourselves and in our relationships with others, taking us into unsuspected realms of consciousness. “We can see ourselves connected to other human beings, belonging to the whole planet, and even a part of the entire universe in a way that extends our own dimensions far beyond our merely mortal selves,” says Siegel. “In this state, we become part of something that has existed long before we were born and will continue long after we die.”

Mary Sykes Wylie, Ph.D., is a senior editor of the Psychotherapy Networker. E-mails to the author may be sent to mswylie@maineline.net. Letters to the Editor about this article may be sent to letters@psychnetworker.org.