

At the tail end of a sweltering, humid Chicago day in 1993, I took my family to the community pool for a dip. As the children splashed gleefully, I sat nearby reading Robert Ornstein's new book, *The Evolution of Consciousness*, unaware that my life was about to change.

Seven years earlier, I'd emerged from my doctoral studies utterly dissatisfied with existing answers to the question of why people continue to behave in self-defeating, irrational ways despite clear evidence that their methods aren't working. Few questions were more important to the enterprise of psychotherapy, yet the answers at that time were highly speculative—running the gamut from unresolved childhood issues to low ego strength to family homeostasis to secondary payoffs, with little scientific evidence to support any of them. Deeply discouraged, I wondered if I'd chosen the wrong career.

From the first page of Ornstein's book, it was clear to me that he was on to something new. Using hard neuroscience data, he proposed that we behave irrationally because our brains are simply not set up to produce rational behavior. Throughout history, he argued, we've been operating under a great deception—we tend to believe that our thoughts and actions result largely from our conscious intentions. In fact, while our rational mind has a degree of veto power, the inclinations that fuel our perceptions, interpretations, and actions primarily come from neural processes that operate beneath the level of awareness. The fact that most of us have fallen for the great deception isn't our fault. Because we're aware only of our conscious thoughts, we readily assume that they're the prime movers in our brains. We're a bit like the men in the movie *My Big Fat Greek Wedding*, who think that because they consider themselves the "head of the house," they're in charge. But remember Maria's famous quote? "The man is the head, but the woman is the neck. And she can turn the head any way she wants." In the brain, nonconscious urges and impulses are the neck, and conscious thought is merely the head.

To support this idea, Ornstein cited the work of Benjamin Libet, the University of California San Francisco researcher who found that by monitoring brain activity, he could tell when subjects were going to initiate simple wrist-flicking movements *before* the subjects were aware of deciding to flick their wrists. Libet's findings ran contrary to the way most of us experience ourselves. Most of us think, "When I move, it's because I decided that I was going to move." But Libet's studies showed that impulse and inclination *preceded* conscious intention. It was as though somebody else in the subject's brain decided when he or she would flick his or her wrist. Initially, Libet's study stirred a storm of controversy, but over the next few decades, his findings would be replicated time and time again, with more and more sophisticated technologies, leading to him winning a Nobel Prize for his contributions.

THE Great Deception

BY BRENT ATKINSON

We're less in control than we think

The sun was setting by the time I reached the end of *The Evolution of Consciousness*. I hauled the kids out of the pool and herded them into the car. On the drive home, I remember thinking that if Ornstein were right, I'd need to rethink my assumptions about nearly everything concerning human behavior, including psychotherapy. For me, reading his work was a genuine eureka moment. But figuring out a way to actually use this new brain knowledge with my clients would turn out to be tough, painstaking work. Still,

I decided that I was up for the challenge—if my clients were.

THE KNEE-JERK BRAIN

Investigating the studies cited in Ornstein's book soon plunged me into the work of other pioneering researchers in the as-yet-unnamed field of affective neuroscience. Researcher Antonio Damasio's work played a key role in furthering my understanding of the power of automatic processes in the brain. Damasio studied the brains of people who'd suffered a unique kind of brain damage that had left their cognitive abilities intact, impeding only their ability to experience emotions normally. Despite testing that confirmed that all the building blocks of rationality were in place, these people couldn't make effective real-life decisions. At first, Damasio was puzzled. Why would impairment in the emotional brain interfere with practical decision-making? He eventually realized that the emotional brain plays a crucial role in the machinery of rationality: the brain generates quick, gut-level emotional reactions that collectively serve as a guidance system for reasoning.

Until reading Damasio's studies, I'd assumed that successful people were effective because they resisted the pull of their emotions of the moment and used reasoning to guide their actions. Damasio's studies powerfully challenged this notion, suggesting that disciplined people are every bit as much influenced by emotional impulse and inclination as undisciplined people are. The difference is that their impulses are more balanced.

This was a revolutionary concept for me. I'd never considered the possibility that disciplined people took too much credit for their efforts. According to Damasio, a disciplined person was simply someone whose nervous system naturally generated a wider range of gut-level emotion reactions than an undisciplined person. Whereas undisciplined people are influenced

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primarily by the gut feelings they experience in the present moment (e.g., wanting to blow off a homework assignment and watch a movie), disciplined people are equally influenced by good and bad feelings generated while remembering the past (e.g., feeling bad remembering the grade reduction resulting from missing an assignment) or envisioning the future (e.g., feeling good in anticipation of a job completed).

Gradually, I began to accept the concept that conscious understanding and effort weren't the mighty forces that I'd assumed they were and that automatic urges and inclinations were much stronger than I'd ever imagined. In fact, confirming evidence seemed to pop up everywhere. In my therapy practice, I began to notice the wide range of my clients' natural inclinations. I saw some people naturally plunge

into rumination whenever they got upset, while others let go and refocused with relative ease. Some naturally experienced an abundance of feelings of warmth, tenderness, and playfulness, while others rarely had these feelings—even when life was going pretty well. Some intensely felt a measure of what others were feeling, while others could only infer what people were feeling from their words and actions. The list went on.

Just as the Cookie Monster couldn't decide one day that he liked broccoli more than Oreos, the apparently automatic reactions that determined how people behaved in these areas seemingly couldn't be changed at will. Such behaviors appear so deeply ingrained that they seem to be part of our second nature. Nevertheless, they wield tremendous influence on the quality of our lives. People who tend toward knee-jerk defensiveness don't function as well as those who respond less defensively: they're impervious to corrective feedback, and their partners regularly feel dismissed. Likewise, people who don't feel much affection toward others seem to have more trouble forming close relationships than people who experience loving feelings freely.

Up to this point, most of my therapeutic efforts had been focused on helping clients develop better understandings of their lives and, as a result, make better choices. I'd wanted to help them live more consciously, but my confidence in the effectiveness of awareness and effort was waning. With my new understanding of the brain, I knew gut-level inclinations were more likely to sit in the driver's seat, and the most that our conscious, willful selves could do was to try to influence these inclinations from the back seat, unless—and this was a big unless—there was a way to retrain the emotional brain.

FOCUSED PRACTICE

One of my first experiments in trying to help a client engage in emotional

reconditioning involved Steve, whose wife, Debra, had attended a few sessions and then dropped out of therapy. Steve continued on his own, recognizing that many of his relationship habits were dysfunctional. During previous conjoint sessions, I'd noticed that whenever Debra had voiced a complaint, Steve had predictably become upset and defensive. I knew that Steve would need some way to practice thinking differently at the moments when he was actually upset. So I suggested that he ask Debra if she'd record complaints on a cassette tape, which he could then use to practice being nondefensive. Surprised and intrigued, Debra agreed.

I sent Debra a message asking her to make short 15- to 45-second recordings whenever she felt upset with Steve—the more recordings, the better. After she'd made a week's worth of recordings, she was to give the tape to Steve to bring to our next therapy session. During our next several sessions, Steve and I listened to Debra's recordings together, and I helped Steve pay attention to his automatic reactions when listening to her critical tone. Without feeling the immediate pressure to respond to Debra, he came to recognize that when he felt criticized, his face typically flushed, his features scrunched into a scowl, and his hands tingled slightly. He also noticed that predictable thoughts popped up—such as *She's so controlling!*—and that he always felt an immediate urge to dispute every possible detail of her complaint.

Together, Steve and I developed a practice plan that involved relaxing physically as he listened to her complaints, slowing his breathing down, reminding himself that he could afford to take his time and hear her out, maintaining eye contact without scowling, and then searching for and commenting on understandable aspects of her complaint. For several weeks in our therapy sessions, Steve practiced this sequence while listening to complaint after

complaint. Then one day, he came to our session with a grin on his face, exclaiming, "I think this is beginning to work!"

A few days before, Debra had become upset with him when she'd learned that he'd forgotten to tell his parents that they needed to cancel their plans to get together. "You know what?" Steve said excitedly. "When she was yelling at me, I actually noticed that my breathing was slowing down, and I was really listening to her. I had the urge to justify why I didn't make the call, but I remembered that I could do that later if I needed to and that I could take my time and hear her out." Instead of offering an excuse, Steve told her that he should have made calling his mother a higher priority. "You should have seen the look on her face!" Steve beamed. The fact that Steve's automatic reactions had begun to change after only a few weeks of focused practice made me believe that I was on the right track.

THE WAGES OF BLAME

Soon enough, however, I realized that the reconditioning exercises worked so well for Steve because he was highly self-responsible and motivated to change, while most of the people I saw in therapy didn't think they needed to change—at least not nearly as much as they thought their partners needed to. Motivating partners to take personal responsibility was the most frustrating part of being a couple's therapist for me. Every time I challenged partners to behave differently, they'd counter with some version of "Well, I wouldn't be acting this way if my partner wasn't so selfish (or insensitive, irresponsible, inattentive, immature, misguided, unrealistic, irrational, short-sighted, or biased.)"

They usually had a point. Their partners often behaved just as badly as they themselves did, but to them, it seemed that their partners' actions were far more egregious. Before I could do anything even

approaching "brain retraining" with such clients, I needed a way to help them see their negative habits and understand the role that these habits were playing in the deterioration of their relationships.

I honestly don't know if I'd have succeeded in motivating these clients had it not been for the fact that I'd already read John Gottman's book *Why Do Marriages Succeed or Fail?*, in which he reports on his research finding that the most effective partners in intimate relationships were able to avoid "negative affect reciprocity" (the tendency to respond to negativity with more negativity) and the "Four Horsemen of the Apocalypse" (criticism, contempt, defensiveness, and stonewalling) when they felt provoked. Additionally, Gottman found that it was *especially* when partners were behaving badly that the differences between couples who were destined for satisfying relationships could be most clearly distinguished from couples who were destined for serious trouble.

Gottman's research enabled me to cut through the blame game that so often plagues ailing partners and help them—at least some of them—understand that the ability to respond effectively when they didn't like their partner's actions was a nonnegotiable requirement if they wanted their relationships to thrive. Gottman's research was also valuable because of its precision. He'd zeroed in on the specific habits that were required for relationships to succeed, which helped clients identify exactly where they tended to get off track in their relationships. However, while most Gottman-influenced therapists I talked to were trying to teach clients these skills, I knew that clients wouldn't be able to conjure these skills at a moment's notice as long as their automatic emotional reactions kept getting in the way. To successfully implement these skills, clients would first need to rewire some of their automatic reactions.

THE BRAIN ON MINDFULNESS

For almost 20 years now, I've been exploring methods for helping clients develop new, automatic inclinations that allow better self-regulation, self-attunement, perspective-taking, and empathy, especially in their intimate relationships. But one of the studies with the biggest impact on my approach was published in *NeuroReport* by a team of researchers from Harvard and Yale who'd found that mindfulness meditation may produce growth in brain areas known to be involved in mood regulation, attentiveness, and empathy.

As it turned out, this study was just the first of its kind. Since then, 18 additional studies have been published finding that meditators have significantly greater volume in areas of the brain that produce automatic tendencies relevant to social functioning, including several that found that periods as short as eight weeks of regular mindfulness created predictable changes in the brain. In fact, in 2013, a team of researchers from Brazil and the United Kingdom found that they could distinguish the brains of experienced meditators from those of non-meditators with 94.9 percent accuracy. The evidence is clear—meditation conditions the brain to produce *automatic* inclinations that help people be more attentive and optimistic and less affected by stressful circumstances and anxiety. In other words, the nervous system changes promoted by mindfulness can serve as a stable platform that enables people to act more skillfully in all areas of their lives.

USING BRAIN SCIENCE FOR BEHAVIORAL CHANGE

Over the years, I've come to recognize that there's no one-shot, magic-bullet approach to retraining the human brain. Instead, I've developed a process that systematically combines what we know about the power of the emotional brain, the particular strengths of the rational

mind, the mechanics of mindfulness meditation, and the brain's impressive flexibility to help clients learn to calm their nervous systems and navigate their lives more effectively. This process includes:

1. Conscious pursuit of understanding and change. We need to use our conscious minds to understand our lives, develop ideas about what's healthy and unhealthy, and pursue concrete changes that move us toward health and well-being.

2. Stress reduction and rejuvenation. We need to develop nervous system inclinations that reduce stress, relax the mind, and rejuvenate the body.

3. Distress tolerance and self-regulation. We need to develop nervous system inclinations that help us tolerate the inevitable stress that accompanies making difficult changes and self-regulate in emotionally charged situations.

4. Emotional accessibility. We need to develop nervous system inclinations that produce feelings that connect us to others.

At our treatment center for couples, my colleagues and I begin *stress reduction and rejuvenation* in the first week of therapy, asking partners to start mindfulness classes in conjunction with therapy. While mindfulness training alone won't heal broken relationships, we consider it an indispensable part of the relationship improvement process. Years of experience have taught us that there's only so much that we can do with clients whose default nervous system impulses and inclinations keep them perpetually stressed, edgy, and preoccupied.

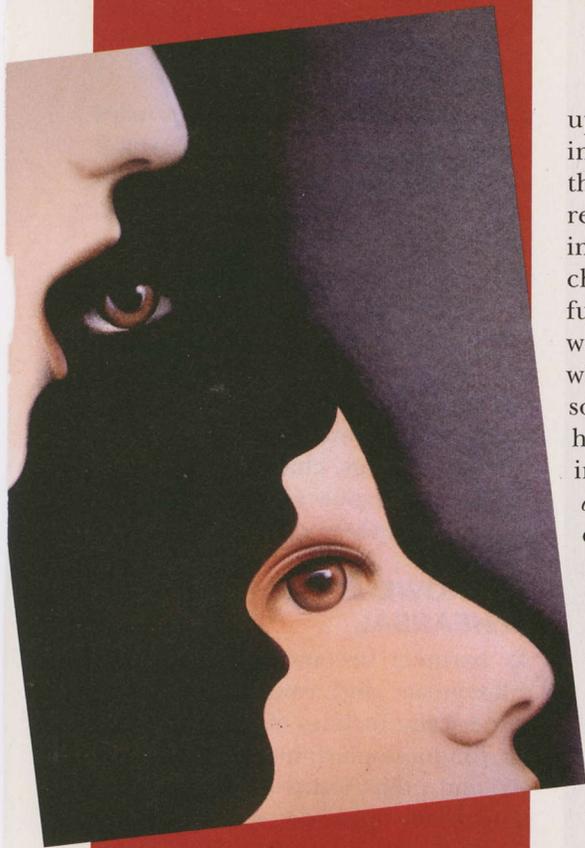
While partners engage in their first eight weeks of mindfulness classes, we use therapy sessions to engage them in the conscious pursuit of understanding and change. Specifically, we help them (1) become aware of studies suggesting that people who believe their partners are "the main problem" are usually mistaken, (2) consider evidence suggesting that this mistake is of no small consequence to relationships,

(3) become receptive to our opinion that their habits have been as damaging to the relationship as their partner's habits, (4) listen with an open mind as we paint a clear picture of their problematic habits, (5) understand why it's in their own best interest to explicitly acknowledge and accept responsibility for their roles in the deterioration of their relationships, and (6) become determined to develop the full set of habits that are characteristic of people who know how to get their partners to treat them well. We also help partners accept mutual responsibility while in the presence of each other. Then we move on to identify the underlying needs, worries, fears, and insecurities that are beneath their previous blaming and defensive postures, and we help them talk about these vulnerable feelings without accusation or blame.

The combination of *stress reduction and rejuvenation* (facilitated through mindfulness classes) and *conscious pursuit of understanding and change* (during therapy sessions) is powerful, and couples often make significant strides in the first two months of therapy. But in my experience, that's rarely enough. Up to this point, the shifts that clients make during sessions are heavily therapist dependent. We help partners self-regulate during sessions. We create the conditions that enable them to connect with vulnerable feelings. The biggest challenge for them is still ahead: learning to rewire their brains to produce automatic inclinations that enable them to do these things on their own. This is hard, gutsy work, but it can produce substantial change, so we help clients walk the arduous path toward self-regulation through exercises in *distress tolerance and self-soothing* and in *emotional accessibility*.

DEVELOPING CALM IN THE STORM

Neuroscientist and psychiatrist Daniel Siegel notes that the process of turning toward and soothing



As clients feel provoked by their partners' recorded complaints, they practice shutting down all thoughts about their partners' complaints for several minutes while they engage in distress tolerance and self-soothing.

upset feelings (rather than focusing exclusively on the external threats) is what good parents do in responding to feelings of distress in their children. Before helping children solve their problems, skillful parents relax, turn toward and welcome their children's feelings while providing direct physical soothing—often through hugging, holding, and other forms of nurturing contact. Similarly, *distress tolerance and self-soothing* exercises help clients turn toward their own upset feelings and engage directly in physiological soothing, temporarily postponing thoughts about problems. This process of self-accompaniment elicits a sense of calm in the storm, allowing clients to avoid alarm or panic when things aren't going well.

We begin by asking clients to notice when small annoyances or disappointments occur in the course of each day. When they notice these frustrations, clients stop what they're doing and spend one to three minutes resisting the urge to analyze their upsetting circumstances. Instead, they're encouraged to slow down their breathing and focus attention on their physical sensations.

We've found that the key to reconditioning automatic reactions involves *frequent* reconditioning exercises that are practiced in *close proximity* to each other. The brain will acquire a new habit more quickly if a person practices the new habit once a day for 14 days than if a person practices it one time per week for 14 weeks. I learned this concept decades ago from Albert, the white lab rat I worked with in my college experimental psychology class. Albert learned new behaviors, like running to a specific area of his cage, with fewer conditioning trials when he was rewarded for desired behavior once per hour than when he was rewarded for it once per week. This is why we ask partners to practice with every upset feeling—no matter how small—that they experience

on a daily basis. We emphasize that most of the work involves simply remembering to do the exercises and being willing to interrupt whatever they're doing for a couple of minutes. If practiced faithfully, these small moments will change their brains within weeks. We want clients to understand that each day that goes by without practicing *distress tolerance and self-soothing* decreases the likelihood that their brains will begin to produce calming instincts and inclinations automatically.

Clients begin by practicing with mild upset feelings. Once they've worked with mild upset feelings every day for at least a week, they move on to more intense feelings. For this level of practice, we want the upset feelings to be stronger, but not so difficult that clients get hijacked by them and are unable to practice. One method involves having clients listen to complaints that their partners have prerecorded, as I had Steve do with Debra's complaints in the days of tape recorders. (Now we have the added convenience of making recordings on our smartphones.) Some clients don't need to listen to recordings to activate upset feelings. They can feel upset just by setting aside times to regularly remember recent upsetting events. To many people this sounds crazy. "Why would I want to deliberately make myself upset?" they balk. The answer is so they can practice calming themselves frequently enough to wire their brains with an instinct to remain calm during upsetting situations.

Although the point of triggering is to learn how to calm oneself and eventually not get triggered in the first place, it's undeniably painful work. When clients lose their nerve I empathize with them, readily acknowledging that there have been weeks, months, and even whole phases in my life when I just haven't had the energy or motivation to engage in practices that would've been good for me. Sometimes life is like that; you just can't sustain the

courage or motivation to press on, and it's wise to cut yourself some slack. I support clients who need to back off, but I don't want them to delude themselves. Even as they're backing off, I encourage them to consider that at some point, they'll probably need to find the motivation to engage in difficult practices such as these if they want their habitual reactions to change.

Intense upset feelings during actual arguments are the most difficult for clients to practice with; however, clients who have practiced diligently with mild and moderate feelings can usually soothe intense feelings as well. First, we familiarize them with the process of working with intense feelings in advance, when they're calm and can fully take in each element of practice. Then during conjoint sessions, we ask them to discuss hot issues, the ones that trigger strong feelings. Ahead of time, clients agree that when they're triggered, they'll take session breaks for the purpose of practicing *distress tolerance and self-soothing*, and I give them the set of instructions in the box on the next page to help them through each of the steps.

Once partners have gone through the steps described in the box to the right, they resume the session and continue discussing the troubling issue. Sometimes another break is needed, and often there isn't time for issues to get resolved by the end of sessions. To feel okay about this lack of resolution, clients must care more about acquiring the ability to self-soothe and tolerate distress than they do about resolving issues quickly. They must believe that ultimately, the ability to react less intensely and operate with less desperation will lead to easier resolution of differences—and this benefit will extend over time throughout their relationship. They must be willing to exchange the value of quick resolution for the long-term benefits that will come from investing time in reconditioning their brains for calmer reactions in upsetting situations.

Coaches and trainers have long used focused mental exercises to help athletes enhance performance, but only recently have we discovered just how powerfully mental exercises can change the brain.

After they've had success on their own during session breaks, we ask clients to begin practicing at home by taking breaks during real-time arguments. When people have difficulty engaging in *distress tolerance and self-soothing* exercises at home during arguments, it's usually because they're not fully committed to getting better at them. Deep down, they may not believe that calming themselves will matter much. They may feel that they've been calm during arguments in the past and it hasn't made any difference; their partners were still unresponsive. I agree with such clients, acknowledging that staying calm by itself won't be enough—they may also need to stand up for themselves. To heighten motivation for these clients, we spend quite a bit of time discussing studies showing that the ability to calm oneself in the face of conflict is highly correlated

with getting satisfying responses from one's partner. We then ask clients to complete logs in which they record each upsetting incident, how much time they spent trying to shut down mental chatter and focus on physical self-soothing, and how much calmer they felt after practicing. The good news is that for clients who practice diligently with the full range of mild, moderate, and intense feelings, changes take place in their nervous systems within a period of weeks.

THE POWER OF MENTAL REHEARSAL

As partners become better able to self-regulate and resolve differences respectfully, feelings of warmth, interest, fondness, playfulness, sexual interest, and other forms of loving attention often increase spontaneously. However, this doesn't always happen. Years of animosity and indifference often shut down the neural systems that generate such feelings. In his 30 years of studying the neural systems that create social bonds, neuroscientist Jaak Panksepp identified four special operating systems in the brain, which, when active, automatically produce feelings that bring people closer together. One creates a longing for emotional closeness and contact, a second produces feelings of tenderness and the urge to care for others, a third produces the urges for spontaneous and playful social contact, and a fourth activates sexual desire. Any of these systems can go dormant when stressful life circumstances occur. But some individuals, even before experiencing the relationship distress that drove them into therapy, never had an abundance of easy access to some or all of these intimacy-generating neural systems. Is this emotional coolness a fixed state, or can it change? A number of studies in the past decade suggest that, just as our nervous systems can be groomed for better self-regulation, these neural systems can be primed to enable a natural emergence of feelings of connection. We help clients do this through specific,

focused mental practices that we call *emotional accessibility* exercises.

Coaches and trainers have long utilized focused mental exercises to help athletes enhance performance by visualizing goals and concentrating on steps toward goals, but only recently have we discovered just how powerfully mental exercises can change the brain. In a Harvard study conducted by neurologist Alvaro Pascual-Leone, subjects who'd never played the piano before were given instructions and asked to practice a piece for five days, two hours per day, for a total of 10 hours. Before and after these practice stints, their brains were scanned. As anticipated, subjects showed brain changes in the areas of the motor cortex that corresponded to the physical movements that they'd practiced.

Another group of subjects randomly assigned to a second practice condition did the same thing as the first group, with one crucial exception: they never pressed the keys of the

piano. Instead, they mentally focused on each of the practice movements. Researchers were amazed to find that these mental-rehearsal-only subjects evidenced almost the same changes in their brains as the subjects who'd practiced using their hands. In other words, mental practice produced changes in the motor cortex even though subjects hadn't moved their fingers—they just visualized moving their fingers.

But how did the purely mental rehearsal, with its accompanying brain changes, affect the subjects' ability to *play* the piece? Here, the results were stunning. Although the people in the mental-rehearsal-only group had never practiced physically, they could play the rehearsed piano piece almost as well as the group who'd practiced physically for five days. And after only one day of physical practice, they could play just as well as them.

The Harvard piano studies aren't the only ones that show brain

and performance-level changes in response to mental rehearsal. A study at the Cleveland Clinic found that subjects could increase their finger strength 53 percent through physical exercises over a 12-week period, but amazingly, a second group showed a 35 percent strength increase through mental visualization only. In a 2007 study conducted at Bishop's University in Quebec, college athletes who engaged in hip flexor exercises increased their muscle strength 28 percent, while a mental-rehearsal-only group strengthened the same hip flexor muscles by 24 percent.

Can feelings, too, be changed through mental exercise? The answer appears to be yes. Over the past decade, dozens of studies have been published on a particular form of mental rehearsal known as compassion meditation. The exercise involves spending extended periods of time focusing on the intent and

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Distress Tolerance & Self-Soothing: *Guidelines for Clients*

1. Stop what you're doing and say to yourself:

- I can afford to slow down and try to relax.
- I've got some time to figure out how to handle this situation.
- I'm not going to just let it go without saying something.
- If I can get calmer, I'll be more powerful.

2. Now identify the behind-the-scenes facts that are making you feel upset. Write your answers to these questions:

- What seems to be the sad or disturbing truth about why this person is acting this way?
- What bad thing is happening here that seems similar to a bad situation that's happened before? Is the same bad thing happening now?
- What will happen if I can't get this sort of thing to stop happening?

3. Propose to yourself that the answers to these questions may not be as clearcut as they seem. One by one, go back through each question and say to yourself: "Maybe things are as they seem, and maybe they aren't."

4. Set your thinking about these questions and about the upsetting situation aside for now. Assume a first-things-first attitude: "First I'm going to get myself into a state of mind where I feel less upset; then I'll think things through and figure out what to do."

5. Pay attention exclusively to the physical sensations that go along with your feelings. Welcome these sensations. Avoid trying to change them. Just accompany them while "giving them air" through slow breathing. Think of slow breathing as like putting an oxygen mask on the part of you that feels upset. Take big inhales and then long, slow exhales.

6. If thoughts pop up, acknowledge them. Then without judging yourself, gently bring your attention back to the physical sensations. Do this as many times as needed.

7. Alternate between paying attention to physical sensations that go along with the feeling and giving mindful attention to your breath, other body sensations, and your immediate surroundings. Use any mental images that help you feel more at ease.

8. If you can't seem to stop ruminating about the upsetting circumstances, engage in an activity that requires your full attention. Later, when you're feeling better, go back and give some thought to how you can best respond to the upsetting circumstances. If you begin feeling upset again, start at #1 and follow these guidelines one more time.

desire to develop feelings of compassion and loving-kindness for others. Just as mental rehearsal promoted changes in the motor cortex of Pascual-Leone's piano players, brain scans have revealed that brain circuits involved in empathy, positive emotion, and emotional regulation are dramatically changed in subjects who'd extensively practiced compassion meditation.

A 2013 study from a University of Wisconsin research team, published in *Psychological Science*, showed that focusing daily on the intention to be loving and compassionate not only strengthened feelings of compassion and related neural underpinnings, but also increased the concrete altruistic behavior of subjects. A 2013 study from Emory University published in *Social, Cognitive and Affective Neuroscience* found that compassion meditation boosted something called "empathic accuracy," a person's ability to read the facial expressions of others. In this study, the meditators, in comparison to those in the control group, showed significant increases in neural activity in areas of the brain important for empathy, and these brain changes accounted for changes in the participants' empathic accuracy scores.

These studies suggest that simply dwelling on the intention to develop a specific feeling activates the neural circuits responsible for producing that feeling. In focusing on the intention to be compassionate, meditators primed their brains for compassion. It's reasonable to assume that the same principle applies to other feelings. Thus, if you spend five minutes a day thinking about things you're grateful for, you're likely to energize and create more connection with brain circuits that produce feelings of gratitude. If you spend five minutes a day remembering vividly times when you felt happy (or playful, affectionate, sexual, and so forth), you'll energize and

strengthen brain circuits that can produce these feelings. As neuroscientists explain, anything you consistently give attention to teaches the brain to produce more of it, and this is true with negative thoughts.

At our clinic, we ask partners to spend five minutes each day doing nothing but thinking about things they like about their mates and about good moments that they've spent together. The primary value of this *emotional accessibility* exercise is that each time partners dwell on the good feelings they have toward each other, the neural circuits that generate feelings of connection—such as the middle insula, superior parietal lobule, right periaqueductal gray, left ventral tegmental area, and left rostro-dorsal anterior cingulate cortex—may be strengthened.

However, studies on mental rehearsal and compassion meditation suggest that it's not just any kind of attention that produces these significant changes. Once again, regular, sustained work is essential. The subjects in Pascual-Leone's piano study didn't just wish occasionally for increased piano skills; they spent hours per day specifically imagining the piano moves necessary to develop the skills. Similarly, those involved in the compassion meditation studies didn't just entertain fleeting thoughts about wanting to feel more compassion and loving-kindness; they regularly spent time dwelling on the desire to have more compassion—in some studies up to 40 minutes per day over the course of eight weeks. Reflecting on his experience, one of my clients said, "I can't make a good feeling walk through the door on command, but if I keep holding the door open, sooner or later it'll walk through."

Many people live out their lives without holding this door open. Generally, people fail to do this because they believe it's useless. Early in our lives, most of us are told, "Wishful thinking won't get you anywhere! You need to get off of your butt and

make things happen!" While wishful thinking alone won't get people where they want to go, people who bolster their concrete efforts with focused, sustained intentions are likelier to make desired changes than those who use behavioral efforts alone. Numerous studies over the past decade have shown that surgeons who engage in mental and physical practice together are more skillful than those who engage in physical practice only. Similarly, stroke victims who engage in mental visualization in addition to physical therapy recover functioning faster, and athletes and musicians who combine mental and physical practice perform better.

DOING THE WORK

When I think back on that afternoon years ago when Robert Ornstein was first blowing my mind, I realize that since then almost everything about the way I conduct therapy has changed. I still help clients develop insight and make concrete plans for operating more effectively in their daily lives, but truthfully, this part of my work is more of a sideline. These days, my central concern is reconditioning the brain. Modern neuroscientific discoveries suggest that William James was right in 1890 when he proposed that the basic organizer of the human mind is habit, not rational thought or understanding. Thus, I believe that in the coming years, the most important developments in mental health will involve refining technologies for isolating and intervening in automatic nervous system habits.

Reconditioning the brain isn't the stuff of brief therapy. I ask a lot of my clients, and some weeks I'm better at motivating them than others. Over the years, I've noticed that their willingness to do the work seems to correlate with what's going on within me. The calmer my own nervous system is, the easier it is for me to connect with feelings of love, nonjudgment, empathy, acceptance, and excitement about the

possibilities that lie ahead for my clients. When clients sense qualities in me that they'd like to develop in themselves, they're sold. I can talk about the scientifically proven benefits of mental practice until I'm blue in the face, but unless they sense that I know what I'm talking about through their felt experience of me, they don't buy in. Good for them. In this business, there's no substitute for the real thing. 

Brent Atkinson, PhD, is director of post-graduate training at the Couples Research Institute in Geneva, Illinois, and Professor Emeritus at Northern Illinois University. He's the author of Emotional Intelligence in Couples Therapy: Advances from Neurobiology and the Science of Intimate Relationships and Developing Habits for Relationship Success. Contact: atkinson.bja@gmail.com.

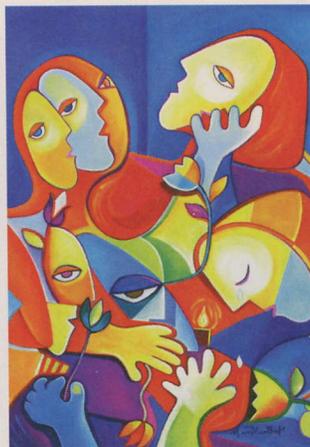
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