

great reverence, as something they only dreamed of doing. “We are really proud of our heritage, and when we do the haka together, that’s a chance for us to look along the line and see our teammates and really connect with the man next to us,” said All Blacks player Keven Mealamu. “A lot of kids growing up as young boys in New Zealand always practiced the haka and wished one day they [would] get an opportunity to do it,” added teammate Aaron Cruden, who said the haka was about “spiritually gaining strength from the guys beside us, from the ground that we stand on.”

But what does the haka have to do with us?

Well, it’s clear that thoughts and feelings shape body language and that each person’s body language speaks to others. Using a purely physical vocabulary, our inner lives communicate, person to person, back and forth. We’re holding entire conversations, exchanging important information, without ever saying a word.

But there’s also something else going on, something that doesn’t really register in such an obvious way: our body language is also speaking to us — to our own inner selves. And it’s not simply telling us what we’re feeling — it’s even more complicated than that. Maybe the power of the haka is not simply its effect on the opposing team members. Maybe the power of the haka also lies in what it does to the All Blacks players themselves. (Portentous drumroll, please.)

7

Surfing, Smiling, and Singing Ourselves to Happiness

I had to decide to stay upright on my surfboard. I didn't know it would help me stay upright in my life, too.

— EVE FAIRBANKS

IF YOU HAPPEN TO marry an Australian, as I did, you are likely to become familiar with the demoralizing process of learning to surf. I’ve put in some time standing shakily on the board (and toppling off it), but it wasn’t until I read journalist Eve Fairbanks on the subject that I realized how deeply connected to presence this process is.

Fairbanks believes that learning to surf taught her something about how to live on dry land! As she wrote in the *Washington Post*, “Surfing distills into a pure physical moment the usually drawn-out, intellectual, complex challenge of simultaneously accepting what life throws at you and making the best of it.”

Her analysis of learning to surf, a process that requires us to control our physical postures in order to change our psychology, perfectly captures the body-mind connection — how and why it works and why we, unfortunately, tend to overlook it.

Our first mistake, she said, is to focus too much on the specific skills we think are required to become a good surfer — or to be seen as good at our jobs or attractive to potential partners. Fairbanks wrote, “Amateurs imagine adventure sports are all about skills: We have to acquire strength and muscle memory before we can accomplish a sporting feat.” With this mind-set, Fairbanks at first fixated on how she measured up, whether or not she had skill, and where she was on the learning curve — all of which made her insecure. “At first,” she said, “when I fell, I felt a desperate desire for my teacher to tell me my mistakes were normal, that I didn’t measure up poorly against the others he’d taught. It was so similar to my yearning, often, to be reassured that my mistakes don’t reflect badly on my character.”

But at a certain point she changed her approach. “After a mixed record of successes and failures, my teacher told me that at some point I just had to ‘decide to stay on the board,’” she recalled. “It was astonishing to experience how great a difference simply making that decision and being tenacious about it made. Where I’d been falling most of the time, I began to catch every wave. Pleasure built upon pleasure, the certainty of my ability amplifying with each new trial.”

Her experience suggests that we might have the “recipe for success” backwards. “Advisers often tell us we have to be confident about our decisions. That decisions come at the end of a certainty-acquisition process and simply ratify an inner truth. But in fact, it goes the other way: Decisions create confidence. That’s what I learned on my surfboard.”

The lesson stuck, and she soon found that it applied off the board as well. “Faced with on-land choices — the kind of choices I sometimes balk at — I felt my body on the board, choosing and succeeding to stay upright. It made it much easier to believe I could stay on the figurative board of a plan.”

By staying on that board, Fairbanks’s body showed her what she was capable of in a way that thinking never could. “The problem,” she said, “is that what lies inside our minds is invisible. We can only imagine it. But we experience our bodies sensually. It’s so powerful to get a sense of our character as our bodies express it, as all of our senses perceive it.”

A sense of our character as our bodies express it . . .

“I’m Happy Because I Sing”

I am endlessly puzzled by the myth that the body, brain, and mind are separate and autonomous entities — and by the notion that seeing them as connected is a “fringe” idea. Is the brain not located *inside* the body? And if that isn’t evidence enough, the body moves, speaks, responds, breathes, *lives* because of the brain. The body and brain are part of a single integrated, complicated, beautiful system. As Oakley Ray, revered former psychologist at Vanderbilt University, said, “There is no real division between mind and body because of networks of communication that exist between the brain and neurological, endocrine and immune systems.”

And can one have a mind without a brain? That the body, brain, and mind are connected should be among the least controversial ideas in all of science. Yet statements about this connection often elicit skeptical reactions. When I made a comment about the body-mind connection, a stranger snarkily replied, “Have you been smoking a pack of Chopras?” (Referring, of course, to the teachings of mindfulness guru Deepak Chopra.)

The Harvard University Department of Psychology resides in William James Hall. Its namesake, William James (1842–1910), must have been quite a guy. Many great psychologists have

populated the halls of Harvard, but James's legacy outshines them all. He was the first educator to offer a college-level psychology course in the United States, he remains one of the most famous American philosophers ever, and he is known as the father of American psychology.

Although countless Jamesian ideas have helped shape what today's psychologists study, the one that struck the deepest nerve with me comes through in his famous assertion "I don't sing because I'm happy; I'm happy because I sing."

This provocative idea asserts that bodily experiences cause emotions, not the other way around. According to James, we experience or perform a physical sensation or action with our bodies, and that causes us to feel a certain way. "A purely disembodied emotion is a nonentity,"³ he wrote in 1884. James, it should be clear, was not "smoking Chopras"; Deepak Chopra wouldn't be born for another sixty-three years.

Believing that our emotions are interpretations of our bodily, visceral experiences, James theorized that we can fake an emotion until we actualize it — that we can sing ourselves to happiness or cry ourselves to despair. James, a great intellectual — a term that is these days too often confused with "cynic" — was also full of hope, encouraging people to "begin to be now what you will be hereafter."

Perhaps James's theory doesn't strike you as particularly controversial, but keep in mind that humans — typically stuck in our heads — do tend to believe that emotions happen first, before physical sensations, and that what happens in our minds is the cause of what our bodies do and feel, not, as James proposed, the outcome.⁴ He wrote: "Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect . . .

and the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble."⁵

James even suggested — again, in 1890 — that one way to test his theory would be to examine the emotions of people with no bodily sensations. It took more than a hundred years for a group of researchers, led by Hugo Critchley, to follow his advice and measure the emotional experiences of patients with pure autonomic failure (PAF), which leads to degeneration of the feedback mechanics of the sympathetic and parasympathetic nervous systems — meaning that people with PAF have significantly decreased bodily sensations.

Compared to the rest of us, the study found, people with PAF reported muted emotional experiences, less fear-related neural activity, and were less adept at understanding how other people's feelings were affected by a situation. In other words, an impaired connection with the body leads to a muffled connection with one's own emotions — and a somewhat diminished ability to read the emotional responses of other people.⁶

About Face

If you were going to conduct an experiment to directly test James's hypothesis that bodily expressions cause emotions, where would you begin? The face seems like a good place to start, but which facial expression? Which emotion? To create a proper test of how the body influences the mind, you'd have to get someone to make a facial expression without associating it with the emotion it connotes. A tricky thing to manage.

In 1974, the psychologist James Laird published the results of a study in which he'd set out to measure whether physically expressive

behavior can create emotional experience — or, in English, whether frowning makes us angry and smiling makes us glad.⁷

Laird knew that telling his subjects the purpose of the experiment might bias their answers, so he constructed a clever ruse to throw them off. First he told the participants (undergraduate men) that the experiment's aim was only to study "the activity of facial muscles under various conditions." Then he attached electrodes to various points on their faces and connected them to fancy-looking machinery that in fact did nothing.

In order to arrange an "angry" expression, he would lightly touch the electrodes between their eyebrows and say, "Now I'd like you to contract these muscles." He'd also touch the electrodes at the corners of the jaw and ask the subjects to contract those, perhaps by clenching their teeth. For a "happy" expression, he asked subjects to contract the muscles at the corners of the mouth.

As subjects held these poses, they were asked to rate their emotions. Laird told them he needed these ratings in order to rule out any error, because sometimes emotions can create unwanted changes in facial muscle activity. Another falsehood to throw them off.

Even after excluding all the subjects who suspected what was up, Laird found that subjects felt angry when holding an angry expression and happy when holding a happy one. One participant even told him: "When my jaw was clenched and my brows down, I tried not to be angry, but it just fit the position. I'm not in an angry mood, but I found my thoughts wandering to things that made me angry, which is sort of silly, I guess. I knew I was in an experiment and knew I had no reason to feel that way, but I just lost control."

In a famous 1988 paper, Fritz Strack, Leonard Martin, and Sabine Stepper went even further, describing the results of a study that tested what had by then come to be known as the facial feedback hypothesis.⁸ Without explaining why, they instructed partic-

ipants to hold a pen in their mouths in a way that engaged the muscles typically associated with smiling. Other randomly selected participants were told to hold a pen in their mouths in a way that inhibited the smile muscles. All participants were then given cartoons to read. People in the smile condition found the cartoons much funnier than the people who were unable to smile. That finding has been replicated in Japan and Ghana⁹ and extended through the use of different methods and the analysis of different outcomes. For example, in other experiments, people whose muscles were made to smile showed less racial bias.¹⁰

As researchers discovered in the decades that followed, facial feedback is not limited to smiling and good moods: it also drives negative emotions. In a study led by a team in Japan, when experimenters dripped water onto subjects' cheeks near the tear ducts, these subjects felt much sadder than those who had been randomly assigned to the no-crying condition.¹¹ In other studies, researchers forced participants to furrow their brows — either by applying stretched adhesive bandages to their faces or by simply asking them to "push their eyebrows together" — inducing increases in self-reported feelings of sadness, anger, and disgust.¹²

In the same way that enacting certain expressions prompts corresponding emotions, *hindering* those expressions can *block* depression by using, of all things, Botox. When we frown, certain muscles in the forehead — what Darwin called our grief muscles — are activated. Botox (botulinum toxin A) temporarily paralyzes these muscles, thereby reducing wrinkles in the forehead and between the eyebrows. This temporary paralysis also decreases the feedback from the injected muscles to the brain.

Initial evidence that Botox injections might affect emotions came from a 2009 study that compared depression scores of women

who'd had forehead injections of Botox to those of women who'd had other cosmetic treatments, all in the previous seven days to three months.¹³ The botulinum toxin A recipients scored much lower than the other group on a measure of irritability, depression, and anxiety. (Scores from before the treatments weren't available.) This despite no significant difference between the two groups in their self-rated attractiveness. The finding is compelling but a bit difficult to interpret, given that the researchers had not randomly assigned the women to a treatment condition and that they hadn't collected a pretreatment assessment of the women's feelings of irritability, depression, and anxiety.

Another group of researchers conducted a randomized controlled trial in men and women with treatment-resistant depression.¹⁴ Half the subjects were injected in the forehead with Botox and half with a placebo. Six weeks later, the Botox subjects scored around 50 percent lower on a measure of depression than they had at the outset. The control subjects' scores dropped only around 10 percent.

Does this mean that Botox cures depression? Before you run out to banish those blues along with your wrinkles, consider another study, conducted by social psychologists David Neal and Tanya Chartrand.¹⁵ They compared female subjects who had received Botox for forehead wrinkles and crow's feet to women who'd gotten dermal filler injections, which don't disrupt communication between the muscles and the brain. Between one and two weeks after the procedure, Neal and Chartrand had the subjects complete a computer task in which they viewed, one at a time, thirty-six black-and-white photographs of people's eyes and the immediate surrounding area of their faces (roughly the area that would be covered by an eye mask when you sleep). What made these photographs noteworthy was that each one expressed a subtly

different emotion (e.g., the subjects appeared irritated, full of desire, flustered, pensive, and so on). The women's task was to identify the correct emotion for each picture by selecting from a list of four possible answers. Women who'd gotten Botox had a harder time: on average, they were around 7 percent less accurate than the other women at reading the subtle emotional cues hidden in people's eyes.

Why does this disconnect occur? It happens because one of the primary ways we decode others' emotions is by automatically mimicking their facial expressions. In everyday life, this mimicry is so subtle and quick (it takes about one-third of a second¹⁶) that we don't even know it's happening. Nonetheless, through the magic of facial feedback, this mimicry allows us to feel and understand other people's emotions. But botulinum toxin A, by disabling our facial muscles, thwarts this process. David Neal explained, "Mimicry gives us a window into other people's inner world. By disrupting mimicry, Botox makes that window just a little darker."¹⁷

And that's not the only reason to embrace your wrinkles. Keep in mind that Botox sometimes targets muscles and wrinkles that relate to both negative *and* positive emotional expressions — not just frowning but smiling, too, which involves the contraction of the same muscles around the eyes that cause crow's feet. It's hard to feel bad when you can't frown. But it's also hard to feel happy when you can't smile.

In short, by paralyzing or relaxing the muscles that allow us to express real emotions, we are dimming both our own emotional experiences and our ability to recognize those of other people. We become just like those PAF patients — less able to connect. Neal said, "It's somewhat ironic — people use Botox to function better in social situations. You may look better but you could suffer because you can't read other people's emotions as well."¹⁸ There's

Presence

a lesson here: be kind to your crow's feet, and they will be kind to you — and they will make it easier for you to be kind to others.

In the time since William James proposed his controversial body-mind theory of emotions, we've amassed a mountain of experimental research testing it. In a recent review of that literature, psychologists James Laird, who conducted the original facial feedback experiment, and Katherine Lacasse concluded: "In literally hundreds of experiments, when facial expressions, expressive behaviors, or visceral responses are induced, the corresponding feelings occur. In each of the types of behavioral manipulation, a variety of feelings have been induced or strengthened. . . . Preventing expressions has reduced many of these same feelings. . . . Overall, the reasonable conclusion, we believe, is that James was in fact correct: Feelings are the consequences . . . of emotional behavior and bodily response."¹⁴

So far we've been talking about the impact of small changes to the muscles that control our faces. But what if we move down to the muscles and bones that direct our below-the-neck expressions? Our shoulders, arms, hands, torsos, legs, and feet? They express, too. Is there such a thing as bodily feedback? Can our bodies teach us to feel powerful, confident, calm, and synchronized? Can they lead us to presence?

Presence Through the Body

He walked along the River Lee, his hands clasped behind his back. A new walk for him. Large and public. The attitude of a thinking man. He enjoyed the pose, found it conducive to the idea of himself.

— Colum McCann, *TransAtlantic*, describing Frederick Douglass

Surfing, Smiling, and Singing Ourselves to Happiness

The "idea of oneself" is an intriguing concept. The self can, presumably, be anything you want it to be. It can even be new, but that doesn't make it insincere or inauthentic. It suggests that you can think of yourself in a certain way and then take steps to bring that self into existence. In the example above, from a 2013 novel by Colum McCann, it means steps in the literal sense: Frederick Douglass, the nineteenth-century African American civil rights activist, walked a new walk, struck a fresh pose, and enjoyed it — he found it conducive to the idea of the person he thought himself to be.

Our bodies, McCann suggests, don't just carry us where we want to go: they can help carry us to who we want to be. And, as we're about to discover, the evidence seems to agree: where our bodies lead, our minds and emotions will follow.

To understand this phenomenon, it will help to look at what happens when the body betrays us, locking us into a defensive, fearful, hypervigilant state rather than leading us to greater personal power. I'm talking about post-traumatic stress.

Imagine all the components of powerlessness — anxiety, stress, fear, threat, self-doubt, negative mood, defensiveness, diminished executive function, memory problems, distracting thoughts, avoidance — and then multiply them. By a lot. That gives you a rough idea of how someone with post-traumatic stress, or PTSD,²⁰ experiences life. Traumatic experiences can rob us blind of personal power.

Trauma, like powerlessness, causes profound disharmony between body and mind. Psychiatrist and longtime PTSD expert Bessel van der Kolk observed that trauma "results in a breakdown of attuned physical synchrony." He wrote, "When you enter the waiting room of the PTSD clinic, you can immediately tell the

patients from the staff by their frozen faces and collapsed but simultaneously agitated bodies.”²¹ PTSD breaks us apart, creating deep psychological fissures and conflicts as we struggle to engage in day-to-day life — to be present with our children, parents, friends, and our colleagues — while vigilantly protecting ourselves from perceived threats and trying to ward off the memories that haunt us. We are divided.

Traditional psychotherapy treatments for PTSD assume that trauma lives in the mind, and they target it there. Cognitive behavioral therapy (CBT), based on the idea that thought guides behavior, seeks to rewire the PTSD sufferer’s thought patterns. Exposure therapy seeks to desensitize the sufferer to the trauma that haunts her by forcing her to recall it, reengage with it, and reexperience it.

But some, like van der Kolk, have questioned these approaches. “Trauma has nothing whatsoever to do with cognition,” he told the *New York Times*. “It has to do with your body being reset to interpret the world as a dangerous place.”²² The idea that trauma lives in the body — and must therefore be sought and healed there — resonates intuitively. As Jeneen Interlandi wrote in the *Times*:

In so many cases, it was patients’ bodies that had been grossly violated, and it was their bodies that had failed them — legs had not run quickly enough, arms had not pushed powerfully enough, voices had not screamed loudly enough to evade disaster. And it was their bodies that now crumpled under the slightest of stresses — that dove for cover with every car alarm or saw every stranger as an assailant in waiting. How could their minds possibly

be healed if they found the bodies that encased those minds so intolerable?

Or, as the artist Frank Gelett Burgess put it, “Our bodies are apt to be our autobiographies.”

Many people suffering from PTSD, along with their families and friends, have asked me if body-mind interventions are being used to alleviate symptoms of this stubborn disorder. At least two-thirds of the e-mails I’ve received on this subject have come from military veterans or their families. The question has plagued me: If trauma is ultimately about extreme powerlessness and characterized by body-mind disconnects, can certain physical interventions help reduce feelings of threat while restoring a sense of pride? Perhaps the body could lead the mind out of states of post-traumatic stress.

As it turns out, a number of scientists have developed a strong body of research on this topic.

Much PTSD research has focused on veterans. Experts conservatively estimate that one in five veterans suffers from PTSD, and that number grows significantly among those who have experienced combat. PTSD in veterans has proved particularly hard to treat with medication and traditional psychotherapeutic approaches, such as CBT and exposure therapy. In addition, dropout rates for PTSD treatment programs are staggeringly high, especially among veterans, for a number of reasons, including concerns about stigma, competing life demands, and the understandable fear of revisiting the traumatic experience that caused the PTSD in the first place. Meanwhile, the disorder is shattering the lives of countless veterans and their families.

In 2012, Stanford University scholar Emma Seppälä set out to investigate the effectiveness of body-mind treatments to help

veterans with PTSD.²³ Twenty-one American veterans from the wars in Iraq and Afghanistan participated in her study. Eleven of them were randomly assigned to a yoga treatment group; the other ten were placed on a waiting list. Every day for seven days, the eleven veterans in the treatment group were instructed for three hours in sudarshan kriya yoga, a breathing-based technique that other studies have found to be effective in reducing anxiety, depression, impulsive behavior, and even tobacco use while increasing optimism, well-being, and emotion regulation.²⁴

Before going on, I have to come clean. I'm not a yoga person. Until I really dug into the scientific literature on it, I was a skeptic. It wasn't that I thought yoga was *bad* for people; it's that I just couldn't get on board with the idea that it was as good as its practitioners claimed. Sort of like a teenager, I tend to react against any trends that seem suddenly to be everywhere. In addition to all that, practically every day someone would ask me, given my background in ballet and my research interests, "You must do a lot of yoga, right?" Which made me resist it even more.

But I am a scientist, and so now I have to eat my resistance, because the evidence that yoga yields positive psychological and physiological results is nearly impossible to refute. Since yoga-based interventions have moved into the medical mainstream, there have been hundreds — maybe thousands — of empirical studies describing its many health benefits, from reducing blood pressure and cholesterol to easing chronic physical, emotional, and social pain.²⁵ Is every result valid? Was every study well done? Probably not; that's the nature of the scientific beast. But I no longer see yoga as an overhyped trend. When done properly, it can be extraordinarily effective.

Now, to try to explain, in just a few pages, every aspect of how yoga affects the body and the mind would be absurd. We're talking

about an ancient practice, three thousand or so years old, that simultaneously engages physical movement, breath control, and meditative mindfulness, all interacting and flowing together. If you want to learn more about the potential health benefits of yoga, I recommend *Yoga for Pain Relief* by Stanford psychologist Kelly McGonigal. Here we're making what amounts to a short foray into yoga, going just far enough to examine how and why it might reduce anxiety and fear in PTSD sufferers — and in the rest of us, too — while increasing strength and confidence.

I wanted to know more about Emma Seppälä's work with veterans, so I asked if she'd be willing to talk with me about her research. She enthusiastically agreed. Seppälä's yoga intervention for veterans, she explained, started with participants just "sitting comfortably — and taking deep breaths," which naturally expands the chest. The group practiced what in yoga is called victory breath, "what we do when we're in a deep state of rest," which — in an elegantly simple example of the body's ability to change the mind — triggers the calming reflex.

"Breath is such a wonderful way to reduce your physiological activation," said Seppälä. "Understanding that you can control your breathing is a first step in understanding how you can control your anxiety — that you have the tools to do it yourself. When your mind is racing, when something unexpected happens in a social situation, when you don't know what to do, you know you can calm yourself by controlling your breathing."

To assess the effectiveness of yoga on veterans in their study, Seppälä and her collaborators at Stanford took before-and-after measures of eyeblink responses to loud noises (i.e., the startle response, generally exaggerated in PTSD sufferers), respiration rates (generally higher among people with PTSD), and self-reported measures of anxiety (i.e., the frequency of traumatic memories

and nightmares). Given the well-documented resistance of PTSD to treatment, Seppälä was surprised by the results: a month after completing the intervention, veterans who took part in the week-long yoga program showed reductions on all measures of PTSD. And she was stunned when, a full year later, the veterans' symptoms of PTSD and anxiety were still dramatically reduced.

Seppälä described the study as “the most rewarding thing I’d ever done in my life.” One participant wrote to her, “I remember everything that happened [about the traumatic experience], but it no longer has a hold on me.” Another said simply, “Thanks for giving me my life back.”

“Some of these people lived bunkered up in their basements and never left,” she said. “Now they’re going to work, dating, socializing, getting out. I see them smiling again. One of them told me that he’d gone on vacation with his dad and couldn’t believe how happy he felt. But the most important thing to him was when his dad said, ‘I have my son back.’ And now he’s gone on to become a spokesperson for the program.”

You Already Have the Tools You Need to Become Present

In 1997, while working with the Truth and Reconciliation Commission in South Africa, Bessel van der Kolk attended a meeting of a group for rape survivors in Johannesburg and recognized, even in a setting utterly foreign to him, the universal language of trauma. “The women sat slumped over — sad and frozen — [as they did in] so many rape therapy groups I had seen in Boston,” he recalled in his book *The Body Keeps the Score*. “I

felt a familiar sense of helplessness, and, surrounded by collapsed people, I felt myself mentally collapse as well.”²⁶

What happened after that sounds like an enactment of William James’s words: “I don’t sing because I am happy; I’m happy because I sing.”

One of the women started to hum, while gently swaying back and forth. Slowly a rhythm emerged; bit by bit other women joined in. Soon the whole group was singing, moving, and getting up to dance. It was an astounding transformation: people coming back to life, faces becoming attuned, vitality returning to bodies. I made a vow to apply what I was seeing there and to study how rhythm, chanting, and movement can help to heal trauma.²⁷

Van der Kolk kept his promise, and he has been studying body-mind methods of overcoming PTSD for decades, conducting research, treating patients, and offering workshops. His recent studies focus on women whose PTSD is caused by domestic abuse, a group that, like veterans, has proved difficult to treat successfully.

In one study, van der Kolk recruited sixty-four women with chronic treatment-resistant PTSD for a therapeutic program. Half were randomly assigned to a yoga group, and the rest were placed in a supportive women’s health education group, a traditional talk-therapy approach. Each group met for a weekly one-hour class for ten weeks.

The women were evaluated pretreatment, midtreatment, and post-treatment on widely used clinician-administered assessments of PTSD. At pretreatment, the groups did not differ from each other. At the midtreatment point, both groups showed a significant

improvement, although the results were much better for those in the yoga group: 52 percent of those patients no longer met the criteria for PTSD, compared to 21 percent in the other group. However, the post-treatment evaluations revealed that, unlike the patients in the yoga group, the women who received traditional treatment later relapsed, showing the same PTSD symptoms they'd had pretreatment. For those in the yoga group, the effects stuck.²⁶

The psychological and physiological benefits of yoga certainly aren't limited to people with PTSD. And although the benefits of participating in long-term therapeutic programs are obvious, scientists have found that people experience beneficial effects even after a single fifteen-minute chair-based yoga session. In one study, participants held a series of gentle postures (e.g., arms extended above the head followed by a back bend and side bend) for approximately thirty to sixty seconds each; they then repeated the cycle. The participants showed significant decreases in self-reported stress as well as decreased breathing rates and increased heart-rate variability (HRV). Low HRV, which indicates lack of fluctuation in the heart rate in response to breathing, is linked to anxiety and emotional strain; high HRV indicates that breathing and heart rate are in sync. In other words, increased HRV, like a slow breathing rate, is generally good, an indication of basic well-being.²⁹

We can probably all agree that what we're doing with our bodies when we do yoga has some seriously positive effects. But the really exciting thing is that those of us who don't plan on doing yoga anytime soon can achieve many similar outcomes, because the body-mind effects that yoga activates are available to all of us in our everyday lives. The tools we need to become present are built into our biology. One of them is an action so basic that we usually forget we're doing it: breathing.

Numerous psychophysiological mechanisms have been impli-

cated in body-based interventions such as yoga, but most interventions end up zeroing in on two of them: the sympathetic nervous system (SNS), which stimulates our stress response, also known as our fight-or-flight response, and the parasympathetic nervous system (PNS), which stimulates our relaxation response, also known as our rest-and-digest response (it sets in, for example, after eating, during sleep, or when we're sexually aroused). These two complementary systems regulate arousal throughout the body. In basic terms, the SNS is the accelerator, and the PNS is the brake.

The key agent of the PNS is the vagus nerve, a cranial nerve that carries sensory information between the brain stem and many of our vital organs, including the heart and lungs. When the vagus nerve is doing its job (i.e., when we have high vagal tone), it signals the heart to slow down and the lungs to breathe more deeply, promoting a state of calm. (Endurance runners, swimmers, and cyclists tend to have high vagal tone.) In situations when your body has an acute stress reaction and the sympathetic nervous system takes over and triggers the fight-or-flight response, the vagus nerve is inhibited.

We don't need our vagus nerves to be on active duty all the time. Some situations that demand alertness and adrenaline — such as a tough mental challenge or a physical threat — naturally reduce vagal tone and elicit a stress response. But often our stress response kicks in unnecessarily, and that can take a negative toll. At rest, high vagal tone is associated with positive physical and mental health, while excessive and sustained vagal withdrawal has been associated with high self-reported levels of stress, anxiety, and depression.³⁰

Here's the good news: we actually have some control over our sympathetic and parasympathetic nervous systems. Recall that the vagus nerve carries information between the brain stem and

the organs; the traffic goes both ways. As van der Kolk explains, “Some 80 percent of the fibers of the vagus nerve (which connects the brain with many internal organs) are afferent; that is, they run from the body into the brain. This means that we can directly train our arousal system by the way we breathe, chant, and move, a principle that has been utilized since time immemorial in places like China and India.”³¹

Take a second right now to focus on your breath: inhale quickly, then slowly exhale. One more time: inhale for two seconds, then draw out your exhale for around five seconds. Notice anything? Slow exhalation triggers your parasympathetic nervous system, decreases your blood pressure, and increases your HRV. Hundreds of studies have measured the effects of relaxation-focused breathing, with similar results. Psychological outcomes include reduced anxiety and depression and improved optimism, emotional control, and pain management. Behavioral outcomes include reduced aggression and impulsive behavior as well as improved addiction management and work and school performance.³²

That’s one of the reasons yoga can change the way you feel — it naturally prompts you to breathe slowly and rhythmically, as do practices such as chanting, tai chi, qigong, and meditation. But you don’t need to do any of those; you can reap the benefits of breath control almost anywhere at any time. With a few deep, slow breaths, you’ve just changed your body and your mind. Considering that it’s something we all do countless times a day, without any conscious effort whatsoever, breathing is pretty amazing — in ways we’re just starting to understand.

Neuroscientist Pierre Philippot and his colleagues conducted a clever experiment in which they asked a group of subjects to

alter their breathing to make themselves feel emotions such as joy, anger, and fear (one emotion at a time), then report exactly how they did it.³³ That sounds pretty weird, right? How do you create an emotion by changing how you breathe? Don’t worry about it, the participants were told — just try it.

When they were done, they were asked to describe their breathing methods to a second group of subjects without mentioning anything about how the breathing was supposed to summon forth emotional responses. The second group then was asked to breathe as they were taught, after which they were asked what emotions they were feeling.

Can you guess the outcome? When the second group unknowingly followed the instructions for “joy” breathing, they felt joy. It also worked for anger and for fear.

So just by breathing faster or slower, more deeply or more nasally, or with tremors or sighs, people could change their emotions and their states of mind. The researchers noted that the effects of breathing like another person were at least as strong as those reported in facial-feedback studies.

By the way, if you want to feel a little burst of joy right now, here are the breathing instructions the second group of subjects received: “Breathe and exhale slowly and deeply through the nose; your breathing is very regular and your rib cage relaxed.” Feel better?

We can indirectly measure the relaxation response of breathing by looking at physiological markers such as increased HRV and decreased heart rate, blood pressure, and levels of stress hormones such as cortisol. These have all been associated with emotional relaxation. They also tend to improve physical health. Reduced stress hormones, for example, predict a lower risk of heart disease, infection, and cancer.³⁴

Posing Our Way to Presence

The verdict is in, and the science resoundingly says, “William James was right.” Our bodies speak to us. They tell us how and what to feel and even think. They change what goes on inside our endocrine systems, our autonomic nervous systems, our brains, and our minds without our being conscious of a thing. How you carry yourself — your facial expressions, your postures, your breathing — all clearly affect the way you think, feel, and behave.

Eve Fairbanks, who learned to make decisions in the boardroom by standing up on her surfboard, may not have been thinking of yoga or William James as she did so, but she knew she was on to something. “How many other kinds of actions,” she wondered, “might transform our ways of thinking?”³⁵

This chapter has been an attempt to answer that question. We’ve discovered how holding a pen in your teeth makes the world seem funnier, how Botox injections can dull our emotional palettes, how paced breathing can instantly relax us.

What about going bigger, beyond facial expressions and breathing? Can we use our whole bodies — through posture, gesture, and movement (even imaginary movement) — to enhance our personal power in an adaptive way when we need it most? Can we pose our way to presence?

Well, why not?