

CHAPTER 16

LEARNING TO INHABIT YOUR BODY: YOGA

As we begin to re-experience a visceral reconnection with the needs of our bodies, there is a brand new capacity to warmly love the self. We experience a new quality of authenticity in our caring, which redirects our attention to our health, our diets, our energy, our time management. This enhanced care for the self arises spontaneously and naturally, not as a response to a "should." We are able to experience an immediate and intrinsic pleasure in self-care.

—Stephen Cope, *Yoga and the Quest for the True Self*

The first time I saw Annie she was slumped over in a chair in my waiting room, wearing faded jeans and a purple Jimmy Cliff T-shirt. Her legs were visibly shaking, and she kept staring at the floor even after I invited her in. I had very little information about her, other than that she was forty-seven years old and taught special-needs children. Her body communicated clearly that she was too terrified to engage in conversation—or even to provide routine information about her address or insurance plan. People who are this scared can't think straight, and any demand to perform will only make them shut down further. If you insist, they'll run away and you'll never see them again.

Annie shuffled into my office and remained standing, barely breathing, looking like a frozen bird. I knew we couldn't do anything until I could help her quiet down. Moving to within six feet of her and making sure she had

unobstructed access to the door, I encouraged her to take slightly deeper breaths. I breathed with her and asked her to follow my example, gently raising my arms from my sides as she inhaled and lowering them as I exhaled, a qigong technique that one of my Chinese students had taught me. She stealthily followed my movements, her eyes still fixed on the floor. We spent about half an hour this way. From time to time I quietly asked her to notice how her feet felt against the floor and how her chest expanded and contracted with each breath. Her breath gradually became slower and deeper, her face softened, her spine straightened a bit, and her eyes lifted to about the level of my Adam's apple. I began to sense the person behind that overwhelming terror. Finally she looked more relaxed and showed me the glimmer of a smile, a recognition that we both were in the room. I suggested that we stop there for now—I'd made enough demands on her—and asked whether she would like to come back a week later. She nodded and muttered, "You sure are weird."

As I got to know Annie, I inferred from the notes she wrote and the drawings she gave me that she had been dreadfully abused by both her father and her mother as a very young child. The full story was only gradually revealed, as she slowly learned to call up some of the things that had happened to her without her body being hijacked into uncontrollable anxiety.

I learned that Annie was extraordinarily skilled and caring in her work with special-needs kids. (I tried out quite a few of the techniques she told me about with the children in our own clinic and found them extremely helpful). She would talk freely about the children she taught but would clam up immediately if we verged on her relationships with adults. I knew she was married, but she barely mentioned her husband. She often coped with disagreements and confrontations by making her mind disappear. When she felt overwhelmed she'd cut her arms and breasts with a razor blade. She had spent years in various forms of therapy and had tried many different medications, which had done little to help her deal with the imprints of her horrendous past. She had also been admitted to several psychiatric hospitals to manage her self-destructive behaviors, again without much apparent benefit.

In our early therapy sessions, because Annie could only hint at what she was feeling and thinking before she would shut down and freeze, we focused on calming the physiological chaos within. We used every technique that I had learned over the years, like breathing with a focus on the out breath, which activates the relaxing parasympathetic nervous system. I also taught her to use her fingers to tap a sequence of acupressure points on various parts

of her body, a practice often taught under the name EFT (Emotional Freedom Technique), which has been shown to help patients stay within the window of tolerance and often has positive effects on PTSD symptoms.¹

THE LEGACY OF INESCAPABLE SHOCK

Because we can now identify the brain circuits involved in the alarm system, we know, more or less, what was happening in Annie's brain as she sat that first day in my waiting room: Her smoke detector, her amygdala, had been rewired to interpret certain situations as harbingers of life-threatening danger, and it was sending urgent signals to her survival brain to fight, freeze, or flee. Annie had all these reactions simultaneously—she was visibly agitated and mentally shut down.

As we've seen, broken alarm systems can manifest in various ways, and if your smoke detector malfunctions, you cannot trust the accuracy of your perceptions. For example, when Annie started to like me she began to look forward to our meetings, but she would arrive at my office in an intense panic. One day she had a flashback of feeling excited that her father was coming home soon—but later that evening he molested her. For the first time, she realized that her mind automatically associated excitement about seeing someone she loved with the terror of being molested.

Small children are particularly adept at compartmentalizing experience, so that Annie's natural love for her father and her dread of his assaults were held in separate states of consciousness. As an adult Annie blamed herself for her abuse, because she believed that the loving, excited little girl she once was had led her father on—that she had brought the molestation upon herself. Her rational mind told her this was nonsense, but this belief emanated from deep within her emotional, survival brain, from the basic wiring of her limbic system. It would not change until she felt safe enough within her body to mindfully go back into that experience and truly know how that little girl had felt and acted during the abuse.

THE NUMBING WITHIN

One of the ways the memory of helplessness is stored is as muscle tension or feelings of disintegration in the affected body areas: head, back, and limbs in accident victims, vagina and rectum in victims of sexual abuse. The lives of many trauma survivors come to revolve around bracing against and neutralizing unwanted sensory experiences, and most people I see in my practice

have become experts in such self-numbing. They may become serially obese or anorexic or addicted to exercise or work. At least half of all traumatized people try to dull their intolerable inner world with drugs or alcohol. The flip side of numbing is sensation seeking. Many people cut themselves to make the numbing go away, while others try bungee jumping or high-risk activities like prostitution and gambling. Any of these methods can give them a false and paradoxical feeling of control.

When people are chronically angry or scared, constant muscle tension ultimately leads to spasms, back pain, migraine headaches, fibromyalgia, and other forms of chronic pain. They may visit multiple specialists, undergo extensive diagnostic tests, and be prescribed multiple medications, some of which may provide temporary relief but all of which fail to address the underlying issues. Their diagnosis will come to define their reality without ever being identified as a symptom of their attempt to cope with trauma.

The first two years of my therapy with Annie focused on helping her learn to tolerate her physical sensations for what they were—just sensations in the present, with a beginning, a middle, and an end. We worked on helping her stay calm enough to notice what she felt without judgment, so she could observe these unbidden images and feelings as residues of a terrible past and not as unending threats to her life today.

Patients like Annie continuously challenge us to find new ways of helping people regulate their arousal and control their own physiology. That is how my Trauma Center colleagues and I stumbled upon yoga.

FINDING OUR WAY TO YOGA: BOTTOM-UP REGULATION

Our involvement with yoga started in 1998 when Jim Hopper and I first heard about a new biological marker, heart rate variability (HRV), that had recently been discovered to be a good measure of how well the autonomic nervous system is working. As you'll recall from chapter 5, the autonomic nervous system is our brain's most elementary survival system, its two branches regulating arousal throughout the body. Roughly speaking, the sympathetic nervous system (SNS) uses chemicals like adrenaline to fuel the body and brain to take action, while the parasympathetic nervous system (PNS) uses acetylcholine to help regulate basic body functions like digestion, wound healing, and sleep and dream cycles. When we're at our best, these two systems work closely together to keep us in an optimal state of engagement with our environment and with ourselves.

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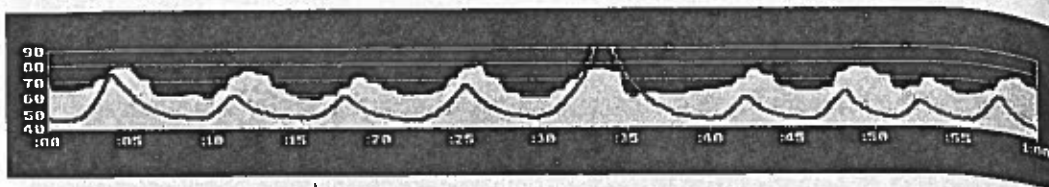
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Heart rate variability measures the relative balance between the sympathetic and the parasympathetic systems. When we inhale, we stimulate the SNS, which results in an increase in heart rate. Exhalations stimulate the PNS, which decreases how fast the heart beats. In healthy individuals inhalations and exhalations produce steady, rhythmical fluctuations in heart rate: Good heart rate variability is a measure of basic well-being.

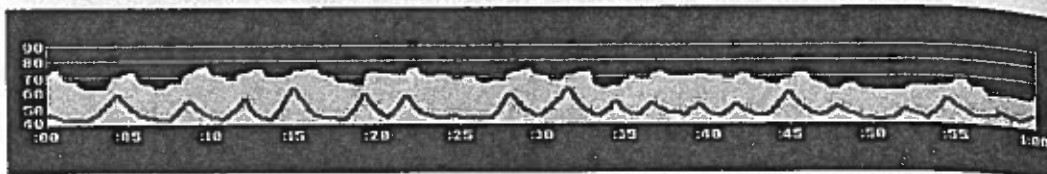
Why is HRV important? When our autonomic nervous system is well balanced, we have a reasonable degree of control over our response to minor frustrations and disappointments, enabling us to calmly assess what is going on when we feel insulted or left out. Effective arousal modulation gives us control over our impulses and emotions: As long as we manage to stay calm, we can choose how we want to respond. Individuals with poorly modulated autonomic nervous systems are easily thrown off balance, both mentally and physically. Since the autonomic nervous system organizes arousal in both body and brain, poor HRV—that is, a lack of fluctuation in heart rate in response to breathing—not only has negative effects on thinking and feeling but also on how the body responds to stress. Lack of coherence between breathing and heart rate makes people vulnerable to a variety of physical illnesses, such as heart disease and cancer, in addition to mental problems such as depression and PTSD.²

In order to study this issue further, we acquired a machine to measure HRV and started to put bands around the chests of research subjects with and without PTSD to record the depth and rhythm of their breathing while little monitors attached to their earlobes picked up their pulse. After we'd tested about sixty subjects, it became clear that people with PTSD have unusually low HRV. In other words, in PTSD the sympathetic and parasympathetic nervous systems are out of sync.³ This added a new twist to the complicated trauma story: We confirmed that yet another brain regulatory system was not functioning as it should.⁴ Failure to keep this system in balance is one explanation why traumatized people like Annie are so vulnerable to overrespond to relatively minor stresses: The biological systems that are meant to help us cope with the vagaries of life fail to meet the challenge.

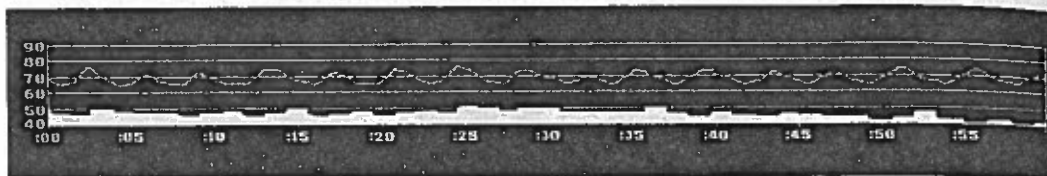
Our next scientific question was: Is there a way for people to improve their HRV? I had a personal incentive to explore this question, as I had discovered that my own HRV was not nearly robust enough to guarantee long-term physical health. An Internet search turned up studies showing that marathon running markedly increased HRV. Sadly, that was of little use, since neither I nor our patients were good candidates for the Boston Marathon.



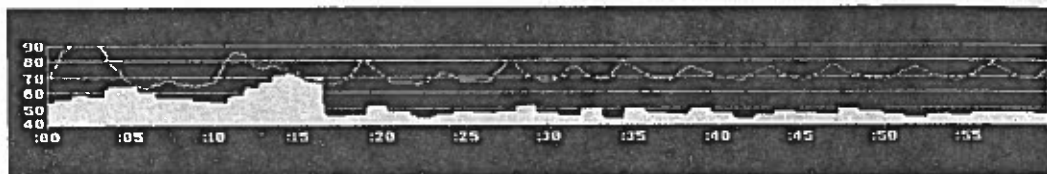
Heart rate variability (HRV) in a well-regulated person. The rising and falling black lines represent breathing, in this case slow and regular inhalations and exhalations. The gray area shows fluctuations in heart rate. Whenever this individual inhales, his heart rate goes up; during exhalations the heart slows down. This pattern of heart rate variability reflects excellent physiological health.



Responding to upset. When someone remembers an upsetting experience, breathing speeds up and becomes irregular, as does heart rate. Heart and breath no longer stay perfectly in sync. This is a normal response.



HRV in PTSD. Breathing is rapid and shallow. Heart rate is slow and out of sync with the breath. This is a typical pattern of a shut-down person with chronic PTSD.



A person with chronic PTSD reliving a trauma memory. Breathing initially is labored and deep, typical of a panic reaction. The heart races out of sync with the breath. This is followed by rapid, shallow breathing and slow heart rate, signs that the person is shutting down.

Google also listed seventeen thousand yoga sites claiming that yoga improved HRV, but we were unable to find any supporting studies. Yogis may have developed a wonderful method to help people find internal balance and health, but back in 1998 not much work had been done on evaluating their claims with the tools of the Western medical tradition.

Since then, however, scientific methods have confirmed that changing

the way one breathes can improve problems with anger, depression, and anxiety⁵ and that yoga can positively affect such wide-ranging medical problems as high blood pressure, elevated stress hormone secretion,⁶ asthma, and low-back pain.⁷ However, no psychiatric journal had published a scientific study of yoga for PTSD until our own work appeared in 2014.⁸

As it happened, a few days after our Internet search a lanky yoga teacher named David Emerson walked through the front door of the Trauma Center. He told us that he'd developed a modified form of hatha yoga to deal with PTSD and that he'd been holding classes for veterans at a local vet center and for women in the Boston Area Rape Crisis Center. Would we be interested in working with him? Dave's visit eventually grew into a very active yoga program, and in due course we received the first grant from the National Institutes of Health to study the effects of yoga on PTSD. Dave's work also contributed to my developing my own regular yoga practice and becoming a frequent teacher at Kripalu, a yoga center in the Berkshire Mountains in western Massachusetts. (Along the way, my own HRV pattern improved as well.)

In choosing to explore yoga to improve HRV we were taking an expansive approach to the problem. We could simply have used any of a number of reasonably priced handheld devices that train people to slow their breathing and synchronize it with their heart rate, resulting in a state of "cardiac coherence" like the pattern shown in the first illustration above.⁹ Today there are a variety of apps that can help improve HRV with the aid of a smartphone.¹⁰ In our clinic we have workstations where patients can train their HRV, and I urge all my patients who, for one reason or another, cannot practice yoga, martial arts, or qigong to train themselves at home. (See Resources for more information.)

EXPLORING YOGA

Our decision to study yoga led us deeper into trauma's impact on the body. Our first experimental yoga classes met in a room generously donated by a nearby studio. David Emerson and his colleagues Dana Moore and Jodi Carey volunteered as instructors, and my research team figured out how we could best measure yoga's effects on psychological functioning. We put flyers in neighborhood supermarkets and laundromats to advertise our classes and interviewed dozens of people who called in response. Ultimately we selected thirty-seven women who had severe trauma histories and who had already

received many years of therapy without much benefit. Half the volunteers were selected at random for the yoga group, while the others would receive a well-established mental health treatment, dialectical behavior therapy (DBT), which teaches people how to apply mindfulness to stay calm and in control. Finally, we commissioned an engineer at MIT to build us a complicated computer that could measure HRV simultaneously in eight different people. (In each study group there were multiple classes, each with no more than eight participants.) While yoga significantly improved arousal problems in PTSD and dramatically improved our subjects' relationships to their bodies ("I now take care of my body"; "I listen to what my body needs"), eight weeks of DBT did not affect their arousal levels or PTSD symptoms. Thus, our interest in yoga gradually evolved from a focus on learning whether yoga can change HRV (which it can)¹¹ to helping traumatized people learn to comfortably inhabit their tortured bodies.

Over time we also started a yoga program for marines at Camp Lejeune and have worked successfully with various other programs to implement yoga programs for veterans with PTSD. Even though we have no formal research data on the veterans, it looks as if yoga is at least as effective for them as it has been for the women in our studies.

All yoga programs consist of a combination of breath practices (*pranayama*), stretches or postures (*asanas*), and meditation. Different schools of yoga emphasize variations in intensity and focus within these core components. For example, variations in the speed and depth of breathing and use of the mouth, nostrils, and throat all produce different results, and some techniques have powerful effects on energy.¹² In our classes we keep the approach simple. Many of our patients are barely aware of their breath, so learning to focus on the in and out breath, to notice whether the breath was fast or slow, and to count breaths in some poses can be a significant accomplishment.¹³

We gradually introduce a limited number of classic postures. The emphasis is not on getting the poses "right" but on helping the participants notice which muscles are active at different times. The sequences are designed to create a rhythm between tension and relaxation—something we hope they will begin to perceive in their day-to-day lives.

We do not teach meditation as such, but we do foster mindfulness by encouraging students to observe what is happening in different parts of the body from pose to pose. In our studies we keep seeing how difficult it is for traumatized people to feel completely relaxed and physically safe in their

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bodies. We measure our subjects' HRV by placing tiny monitors on their arms during *shavasana*, the pose at the end of most classes during which practitioners lie face up, palms up, arms and legs relaxed. Instead of relaxation we picked up too much muscle activity to get a clear signal. Rather than going into a state of quiet repose, our students' muscles often continue to prepare them to fight unseen enemies. A major challenge in recovering from trauma remains being able to achieve a state of total relaxation and safe surrender.

LEARNING SELF-REGULATION

After seeing the success of our pilot studies, we established a therapeutic yoga program at the Trauma Center. I thought that this might be an opportunity for Annie to develop a more caring relationship with her body, and I urged her to try it. The first class was difficult. Merely being given an adjustment by the instructor was so terrifying that she went home and slashed herself—her malfunctioning alarm system interpreted even a gentle touch on her back as an assault. At the same time Annie realized that yoga might offer her a way to liberate herself from the constant sense of danger that she felt in her body. With my encouragement she returned the following week.

Annie had always found it easier to write about her experiences than to talk about them. After her second yoga class she wrote to me: "I don't know all of the reasons that yoga terrifies me so much, but I do know that it will be an incredible source of healing for me and that is why I am working on myself to try it. Yoga is about looking inward instead of outward and listening to my body, and a lot of my survival has been geared around never doing those things. Going to the class today my heart was racing and part of me really wanted to turn around, but then I just kept putting one foot in front of the other until I got to the door and went in. After the class I came home and slept for four hours. This week I tried doing yoga at home and the words came to me 'Your body has things to say.' I said back to myself, 'I will try and listen.'"

A few days later Annie wrote: "Some thoughts during and after yoga today. It occurred to me how disconnected I must be from my body when I cut it. When I was doing the poses I noticed that my jaw and the whole area from where my legs end to my bellybutton is where I am tight, tense and holding the pain and memories. Sometimes you have asked me

alexithymia tend to feel physically uncomfortable but cannot describe exactly what the problem is. As a result they often have multiple vague and distressing physical complaints that doctors can't diagnose. In addition, they can't figure out for themselves what they're really feeling about any given situation or what makes them feel better or worse. This is the result of numbing, which keeps them from anticipating and responding to the ordinary demands of their bodies in quiet, mindful ways. At the same time, it muffles the everyday sensory delights of experiences like music, touch, and light, which imbue life with value. Yoga turned out to be a terrific way to (re)gain a relationship with the interior world and with it a caring, loving, sensual relationship to the self.

If you are not aware of what your body needs, you can't take care of it. If you don't feel hunger, you can't nourish yourself. If you mistake anxiety for hunger, you may eat too much. And if you can't feel when you're satiated, you'll keep eating. This is why cultivating sensory awareness is such a critical aspect of trauma recovery. Most traditional therapies downplay or ignore the moment-to-moment shifts in our inner sensory world. But these shifts carry the essence of the organism's responses: the emotional states that are imprinted in the body's chemical profile, in the viscera, in the contraction of the striated muscles of the face, throat, trunk, and limbs.¹⁷ Traumatized people need to learn that they can tolerate their sensations, befriend their inner experiences, and cultivate new action patterns.

In yoga you focus your attention on your breathing and on your sensations moment to moment. You begin to notice the connection between your emotions and your body—perhaps how anxiety about doing a pose actually throws you off balance. You begin to experiment with changing the way you feel. Will taking a deep breath relieve that tension in your shoulder? Will focusing on your exhalations produce a sense of calm?¹⁸

Simply noticing what you feel fosters emotional regulation, and it helps you to stop trying to ignore what is going on inside you. As I often tell my students, the two most important phrases in therapy, as in yoga, are "Notice that" and "What happens next?" Once you start approaching your body with curiosity rather than with fear, everything shifts.

Body awareness also changes your sense of time. Trauma makes you feel as if you are stuck forever in a helpless state of horror. In yoga you learn that sensations rise to a peak and then fall. For example, if an instructor invites you to enter a particularly challenging position, you may at first feel a sense of defeat or resistance, anticipating that you won't be able to tolerate the

where I feel things and I can't even begin to locate them, but today I felt those places very clearly and it made me want to cry in a gentle kind of way."

The following month both of us went on vacation and, invited to stay in touch, Annie wrote to me again: "I've been doing yoga on my own in a room that overlooks the lake. I'm continuing to read the book you lent me [Stephen Cope's wonderful *Yoga and the Quest for the True Self*]. It's really interesting to think about how much I have been refusing to listen to my body, which is such an important part of who I am. Yesterday when I did yoga I thought about letting my body tell me the story it wants to tell and in the hip opening poses there was a lot of pain and sadness. I don't think my mind is going to let really vivid images come up as long as I am away from home, which is good. I think now about how unbalanced I have been and about how hard I have tried to deny the past, which is a part of my true self. There is so much I can learn if I am open to it and then I won't have to fight myself every minute of every day."

One of the hardest yoga positions for Annie to tolerate was one that's often called Happy Baby, in which you lie on your back with your knees deeply bent and the soles of your feet pointing to the ceiling, while holding your toes with your hands. This rotates the pelvis into a wide-open position. It's easy to understand why this would make a rape victim feel extremely vulnerable. Yet, as long as Happy Baby (or any posture that resembles it) precipitates intense panic, it is difficult to be intimate. Learning how to comfortably assume Happy Baby is a challenge for many patients in our yoga classes.

GETTING TO KNOW ME: CULTIVATING INTEROCEPTION

One of the clearest lessons from contemporary neuroscience is that our sense of ourselves is anchored in a vital connection with our bodies.¹⁴ We do not truly know ourselves unless we can feel and interpret our physical sensations; we need to register and act on these sensations to navigate safely through life.¹⁵ While numbing (or compensatory sensation seeking) may make life tolerable, the price you pay is that you lose awareness of what is going on inside your body and, with that, the sense of being fully, sensually alive.

In chapter 6 I discussed alexithymia, the technical term for not being able to identify what is going on inside oneself.¹⁶ People who suffer from

YOGA AND THE NEUROSCIENCE OF SELF-AWARENESS

During the past few years brain researchers such as my colleagues Sara Lazar and Britta Hölzel at Harvard have shown that intensive meditation has a positive effect on exactly those brain areas that are critical for physiological self-regulation.¹⁹ In our latest yoga study, with six women with histories of profound early trauma, we also found the first indications that twenty weeks of yoga practice increased activation of the basic self-system, the insula and the medial prefrontal cortex (see chapter 6). This research needs much more work, but it opens up new perspectives on how actions that involve noticing and befriending the sensations in our bodies can produce profound changes in both mind and brain that can lead to healing from trauma.

After each of our yoga studies, we asked the participants what effect the classes had had on them. We never mentioned the insula or interoception; in fact, we kept the discussion and explanation to a minimum so that they could focus inward.

Here is a sample of their responses:

- “My emotions feel more powerful. Maybe it’s just that I can recognize them now.”
- “I can express my feelings more because I can recognize them more. I feel them in my body, recognize them, and address them.”
- “I now see choices, multiple paths. I can decide and I can choose my life, it doesn’t have to be repeated or be experienced like a child.”
- “I was able to move my body and be in my body in a safe place and without hurting myself/ getting hurt.”

LEARNING TO COMMUNICATE

People who feel safe in their bodies can begin to translate the memories that previously overwhelmed them into language. After Annie had been practicing yoga three times a week for about a year, she noticed that she was able to talk much more freely to me about what had happened to her. She thought this almost miraculous. One day, when she knocked over a glass of water, I got up from my chair and approached her with a Kleenex box, saying, “Let me clean that up.” This precipitated a brief, intense panic reaction. She was quickly able to

contain herself, though, and explained why those particular words were so upsetting to her—they were what her father would say after he'd raped her. Annie wrote to me after that session: "Did you notice that I have been able to say the words out loud? I didn't have to write them down to tell you what was happening. I didn't lose trust in you because you said words that triggered me. I understood that the words were a trigger and not terrible words that no one should say."

Annie continues to practice yoga and to write to me about her experiences: "Today I went to a morning yoga class at my new yoga studio. The teacher talked about breathing to the edge of where we can and then noticing that edge. She said that if we notice our breath we are in the present because we can't breathe in the future or the past. It felt so amazing to me to be practicing breathing in that way after we had just talked about it, like I had been given a gift. Some of the poses can be triggering for me. Two of them were today, one where your legs are up frog like and one where you are doing really deep breathing into your pelvis. I felt the beginning of panic, especially in the breathing pose, like oh no that's not a part of my body I want to feel. But then I was able to stop myself and just say, notice that this part of your body is holding experiences and then just let it go. You don't have to stay there but you don't have to leave either, just use it as information. I don't know that I have ever been able to do that in such a conscious way before. It made me think that if I notice without being so afraid, it will be easier for me to believe myself."

In another message, Annie reflected on the changes in her life: "I slowly learned to just have my feelings, without being hijacked by them. Life is more manageable: I am more attuned to my day and more present in the moment. I am more tolerant of physical touch. My husband and I are enjoying watching movies cuddled together in bed . . . a huge step. All this helped me finally feel intimate with my husband."