

Chapter One

A MINDFUL AWARENESS

Being aware of the fullness of our experience awakens us to the inner world of our mind and immerses us completely in our lives. This is a book about how the way we pay attention in the present moment can directly improve the functioning of body and brain, subjective mental life with its feelings and thoughts, and interpersonal relationships.

The essential proposal is that this ancient and useful form of awareness harnesses the social circuitry of the brain to enable us to develop an attuned relationship within our own minds. To explore this idea, we will be turning to the research on our social lives, examining the particular regions of the brain, including the mirror neuron system and related circuits, that participate in attunement and may be active when we resonate with our own intentional states.

The term *mindful brain* is used in this approach to embrace the notion that our awareness, our mindful “paying attention or taking care,” is intimately related to the dance between our mind and our brain. Being “mindful” has a range of definitions, from the common everyday notion of “bearing in mind or inclined to be aware” to the specific educational, clinical, and scientific definitions of the term we will explore. It is with this broad general common-usage definition that I will present a review of the new developments in science that have emerged regarding the more

specific forms of mindfulness and one's own subjective experience of the moment at the heart of one's life.

FINDING THE MIND IN OUR EVERYDAY LIVES

Since the mid-1980s there has been growing attention to “mindfulness” in the Western world. This focus has been on a number of dimensions of daily life, from our personal lives to the experience of children in schools and patients in therapy. The busy lives people lead in the technologically driven culture that consumes our attention often produce a multitasking frenzy of activity that leaves people constantly *doing*, with no space to breathe and just *be*. The adaptations to such a way of life often leaves youth accustomed to high levels of stimulus-bound attention, flitting from one activity to another, with little time for self-reflection or interpersonal connection of the direct, face-to-face sort that the brain needs for proper development. Little today in our hectic lives provides for opportunities to attune with one another.

In our personal lives, many of us have found this societal whirlwind deeply dissatisfying. We can adjust, responding to the drive to do, but often we cannot thrive in such a frenetic world. On this personal level people in modern cultures are often eager to learn about a new way of being that can help them flourish. Mindfulness in its most general conception offers a way of being aware that can serve as a gateway toward a more vital mode of being in the world: We become attuned to ourselves.

In a review, Paul Grossman (in press) has stated that the “colloquial use of mindfulness often connotes being heedful or taking care within a clearly evaluative context: A parent tells a child, mind your manners, or ‘mind your language,’ implying to take care to behave in a culturally prescribed manner. ‘Mindful of the poor road conditions, he drove slowly,’ ‘What is man, that thou art mindful of him?’ (Psalms, viii. 4), ‘I promise to be mindful of your admonitions,’ or ‘always mindful of family responsibilities.’ All

these formulations reflect an emphasis on carefully paying attention so as to not reap the consequences of heedless behaviors.”

DEFINING THE MIND

I have found a useful definition of the mind, supported by scientists from various disciplines, to be “a process that regulates the flow of energy and information.”

Our human mind is both embodied—it involves a flow of energy and information that occurs within the body, including the brain—and relational, the dimension of the mind that involves the flow of energy and information occurring between people—from the writer to the reader, for example. Right now this flow from me as I type these words to you as you read them is shaping our minds—yours and mine. Even as I am imagining who you might be and your possible response, I am changing the flow of energy and information in my brain and body as a whole. As you absorb these words your mind is embodying this flow of energy and information as well.

BEING MINDFUL

Mindfulness in its most general sense is about waking up from a life on automatic, and being sensitive to novelty in our everyday experiences. With mindful awareness the flow of energy and information that is our mind enters our conscious attention and we can both appreciate its contents and also come to regulate its flow in a new way. Mindful awareness, as we will see, actually involves more than just simply being aware: It involves being aware of aspects of the mind itself. Instead of being on automatic and mindless, mindfulness helps us awaken, and by reflecting on the mind we are enabled to make choices and thus change becomes possible.

How we focus attention helps directly shape the mind. When we develop a certain form of attention to our here-and-now expe-

periences and to the nature of our mind itself, we create the special form of awareness, mindfulness, which is the subject of this book.

SOME BENEFITS

Studies have shown that specific applications of mindful awareness improve the capacity to regulate emotion, to combat emotional dysfunction, to improve patterns of thinking, and to reduce negative mindsets.

Research on some dimensions of mindful awareness practices reveals that they greatly enhance the body's functioning: Healing, immune response, stress reactivity, and a general sense of physical well-being are improved with mindfulness (Davidson, Kabat-Zinn, Schumacher, Rosenkranz, Muller et al., 2003). Our relationships with others are also improved perhaps because the ability to perceive the nonverbal emotional signals from others may be enhanced and our ability to sense the internal worlds of others may be augmented (see Appendix III, Relationships and Mindfulness). In these ways we come to compassionately experience others' feelings and empathize with them as we understand another person's point of view.

We can see the power of mindful awareness to achieve these many and diverse beneficial changes in our lives when we consider that this form of awareness may directly shape the activity and growth of the parts of the brain responsible for our relationships, our emotional life, and our physiological response to stress.

MINDFULNESS IN LEARNING AND EDUCATION

In addition to such personal and health advantages of mindfulness, the concept of "mindful learning" has been proposed by

Ellen Langer (1989, 1997, 2000), an approach which has been shown to make learning more effective, enjoyable, and stimulating. The essence of this approach is to offer learning material in a conditional format rather than as a series of absolute truths. The learner in this way is required to keep an “open mind” about the contexts in which this new information may be useful. Involving the learner in the active process of education also is created by having students consider that their own attitude will shape the direction of the learning. In these ways, this form of mindfulness can be seen to involve the learner’s active participation in the learning process itself. Langer suggests that the point of conditional learning is to leave us in a healthy state of uncertainty, which will result in our actively noticing new things.

Educator Robert J. Sternberg considered this educational mindfulness as something akin to a cognitive style (2000). Research on mindful learning (Langer, 1989) suggests that it consists of openness to novelty; alertness to distinction; sensitivity to different contexts; implicit, if not explicit, awareness of multiple perspectives; and orientation to the present. Taking these dimensions of mindfulness into account within the educational setting may permit students to deepen and broaden the nature of learning throughout their lifelong careers as learners. Teachers can use terms such as “may,” “might be,” or “sometimes” instead of “is” to promote conditional uncertainty. (See Chapter 12 for more on the role of mindfulness in education.)

Langer herself (1989) has suggested that we be careful about seeing her concept of mindfulness as having the same meaning as the historical and modern use of that term in contemplative practices. For the time being, we will use the qualifier, “mindful learning” to refer to Langer’s important conceptualizations regarding how the mind seems to disentangle itself from premature conclusions, categorizations and routinized ways of perceiving and thinking. When we are certain, Langer says, “we don’t feel the need to

pay attention. Given that the world around us is always in flux, our certainty is an illusion” (Langer, August 2006, personal communication). Ultimately, this form of mindfulness is a flexible state of mind in which we actively notice new things, are sensitive to context, and engage in the present.

I could find no formal studies published that compare mindful learning with its goal-directed educational component to the more ancient contemplative form of what we will call “reflective mindfulness.” This reflective form of mindfulness, what we will also refer to as “mindful awareness” or just “mindfulness” in this text, has now begun to be intensively studied, with new findings that will be discussed in the chapters ahead.

Finding similarities and differences between these two uses of the term *mindfulness* may help us elucidate the deeper nature of each version. Interestingly, research in both forms has revealed that, though achieved through differing means, they are independently associated with positive outcomes in people’s lives, such as an enhanced sense of pleasure, internal awareness, and physiological health. In this book we will be exploring the possible neural mechanisms shared in common by these two important and on the surface distinct dimensions of how we shape our minds in the moment.

MINDFUL AWARENESS

Direct experience in the present moment has been described as a fundamental part of Buddhist, Christian, Hindu, Islamic, Jewish, and Taoist teaching (Armstrong, 1993; Goleman, 1988). In these religious traditions, from mystical Christianity with centering prayer (Fitzpatrick-Hopler, 2006; Keating, 2005) to Buddhist mindfulness meditation (Kornfield, 1993; Nhat Hahn, 1991; Wallace, 2006), one sees the use of the idea of being aware of the present moment in a different light from the cognitive aspect of mindfulness.

Many forms of prayer in different traditions require that the individual pause and participate in an intentional process of connecting with a state of mind or entity outside the day-to-day way of being. Prayer and religious affiliation in general have been demonstrated to be associated with increased longevity and well-being (Pargament, 1997). The common overlap of group belonging and prayer makes it hard to tease apart the internal from the interpersonal process, but in fact we may find that this is just the point: pausing to become mindful may indeed involve an internal sense of belonging.

The clinical application of the practice of mindfulness meditation derived from the Buddhist tradition has served as a focus of intensive study on the possible neural correlates of mindful awareness. Here we see the use of the term *mindfulness* in a way that numerous investigators have been trying to clearly define (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bishop, Lau, Shapiro, Carlson, Anderson, Carmody et al., 2004). These studies, across a range of clinical situations, from medical illness with chronic pain to psychiatric populations with disturbances of mood or anxiety, have shown that effective application of secular mindfulness meditation skills can be taught outside of any particular religious practice or group membership.

In many ways, scholars see the nearly 2500-year-old practice of Buddhism as a form of study of the nature of mind (Germer, Siegel, & Fulton, 2005; Lutz, Dunne, & Davidson, in press; Epstein, 1995; Waldon, 2006) rather than a theistic tradition. "Reading early Buddhist texts will convince the clinician that the Buddha was essentially a psychologist" (Germer, 2005, p. 13). It is possible to practice Buddhist-derived meditation, and ascribe to aspects of the psychological view of the mind from this perspective, for example, and maintain one's beliefs and membership in other religious traditions. In contemplative mindful practice one focuses the mind in specific ways to develop a more rigorous form of present-moment awareness that can directly alleviate suffering in one's life.

Jon Kabat-Zinn has devoted his professional life to bringing mindfulness into the mainstream of modern medicine. In Kabat-Zinn's view, "An operational working definition of mindfulness is: the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, pp. 145–146). This nonjudgmental view in many ways can be interpreted to mean something like "not grasping onto judgments," as the mind seems to continually come up with reactions that assess and react. Being able to note those judgments and disengage from them may be what nonjudgmental behavior feels like in practice. "On purpose" implies that this state is created with the intention of focusing on the present moment. The InnerKids program, designed to teach young children to learn basic mindfulness skills, defines mindfulness as "Being aware of what's happening as it's happening" (Kaiser-Greenland, 2006a).

Kabat-Zinn (2003) went on to note that the Buddhist origins of this view of mindfulness and the natural laws of the mind reveal

a coherent phenomenological description of the nature of the mind, emotion, and suffering and its potential release, based on highly refined practices aimed at systematically training and cultivating various aspects of mind and heart via the faculty of mindful attention (the words for mind and heart are the same in Asian languages; thus "mindfulness" includes an affectionate, compassionate quality within the attending, a sense of openhearted, friendly presence and interest). And mindfulness, it should also be noted, being about attention, is also of necessity universal. There is nothing particularly Buddhist about it. We are all mindful to one degree or another, moment by moment. It is an inherent human capacity. The contribution of the Buddhist tradition has been in part to emphasize simple and effective ways to cultivate and refine this capacity and bring it to all aspects of life. (pp. 145–146)

Ultimately the practices that develop mindful ways of being enable the individual to perceive the deeper nature of how the mind

functions. There are many ways of cultivating mindful awareness, each of which develops an awareness of the faculties of the mind, such as how we think, feel, and attend to stimuli. Mindfulness meditation, as one example, is thought to be especially important for training attention and letting go of a strict identification with the activities of the mind as being the full identity of the individual. One form of cultivation of the mind's awareness of itself is derived from the traditional Buddhist approach of Vipassana, or insight meditation (Kornfield, 1993), which we shall be exploring in depth in Part II.

Mindful awareness practices (MAPs) as we call them at the Mindful Awareness Research Center at UCLA (<http://www.marc.ucla.edu>, see Appendix I), can be found in a wide variety of human activities. Historically, various practices have been developed over thousands of years in the forms of mindfulness meditation, yoga, tai chi chuan, and qui quong. In each of these activities, the practitioner is focusing the mind in a very specific way on moment-to-moment experience.

In almost all contemplative practices, for example, there is an initial use of the breath as a focal point in which to center the mind's attention. Because of this commonality of breath use across cultural practices, we will be discussing the possible significance of breath awareness for the overall processes of the mindful brain.

Modern applications of the general concept of mindfulness have built on both traditional skills of meditation and have also developed unique nonmeditative approaches to this human process of being mindful. A useful fundamental view is that mindfulness can be seen to consist of the important dimensions of the self-regulation of attention and a certain orientation to experience, as Bishop and colleagues have proposed (Bishop et al., 2004): (1) "the self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment"; and (2) "a particular orientation toward one's experiences in the present moment, an orientation

that is characterized by curiosity, openness, and acceptance” (p. 232). In the Dialectical Behavior Therapy approach, mindfulness has been described as “(1) observing, noticing, bringing awareness, (2) describing, labeling, noting, and (3) participating, all of which are done (1) nonjudgmentally with acceptance, (2) in the present moment, and (3) effectively” (Dimidjian & Linehan, 2003, p. 166). Shapiro, Carlson, Astin, & Freedman (2006) have described the mechanisms of mindfulness as consisting of intention, attention, and an attitude that each contribute to a process of viewing in a new way they term “re-perceiving.” These and other authors acknowledge that mindfulness also may result in common outcomes, such as patience, nonreactivity, self-compassion, and wisdom. In Acceptance and Commitment Therapy, mindfulness “can be understood as a collection of related processes that function to undermine the dominance of verbal networks, especially involving temporal and evaluative relations. These processes include acceptance, defusion, contact with the present moment, and the transcendent sense of self” (Fletcher & Hayes, 2006, p. 315).

A synthetic study of numerous existing questionnaires regarding mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) reveals five factors that seemed to cluster from independently created surveys: (1) nonreactivity to inner experience (e.g., perceiving feelings and emotions without having to react to them); (2) observing/noticing/attending to sensations, perceptions, thoughts, feelings (e.g., remaining present with sensations and feelings even when they are unpleasant or painful); (3) acting with awareness/(not on) automatic pilot, concentration/nondistraction (e.g., breaking or spilling things because of carelessness, not paying attention, or thinking of something else); (4) describing/labeling with words (e.g., easily putting beliefs, opinions, and expectations into words); (5) nonjudgmental of experience (e.g., criticizing oneself for having irrational or appropriate emotions).

Except for observation, these were found to be the most statistically useful and reliable constructs in considering an operational

definition of mindfulness. They seemed to reveal four relatively independent facets of mindfulness. Observation was found present more robustly in those subjects, who were college students, who meditated regularly. Observation was considered a learnable skill; future research needs to clarify it as an independent factor. For now we will discuss the five factors that Baer and colleagues (2006) delineated as we explore the nature of mindfulness and the brain.

At this point in the scientific endeavor to operationalize a clear definition for mindful awareness, the most parsimonious approach will be to build on the cumulative wisdom of the breadth of practitioners and researchers in the field. This will be our framework for exploring the ways in which this form of mindful awareness may involve the social neural circuitry of the brain as mindfulness is promoted by a form of internal attunement.

Reflection on the nature of one's own mental processes is a form of "metacognition," thinking about thinking in the broadest sense; when we have meta-awareness this indicates awareness of awareness. Whether we are engaging in yoga or centering prayer, sitting and sensing our breathing in the morning, or doing tai chi at night, each MAP develops this capacity to be aware of awareness.

Awareness of awareness is one aspect of what we can consider a form of reflection. In this way, mindful awareness involves reflection on the inner nature of life, on the events of the mind that are emerging, moment by moment.

LIFE ON AUTOMATIC PILOT: MINDLESSNESS AND MINDFULNESS

The difference between jogging "mindlessly" versus jogging "mindfully" is that in the latter we are aware, each moment, of what we are doing as we are doing it. If we jog and daydream about what we will be doing that night, or what happened yesterday, then we are not engaged in mindful jogging. There is nothing wrong with daydreaming and letting the mind wander: In fact,

as we'll see, mindful practice can intentionally focus awareness on *whatever* arises, as it arises. If we intend to enable our minds to daydream and are aware of our awareness of our imagination, then that would be a mindful reverie, though perhaps not a mindful jog because we would be unaware of our feet and the path in front of us.

Notice here that we can often perform behaviors, such as jogging down a trail, and be lost in thinking about something other than the physical activity. We have neural circuits that carry out this automatic behavior all the time, enabling us to do several things at once, like jog and daydream simultaneously. Yet fortunately, we don't usually trip and fall or crash the car on the highway.

For some people, this "living on automatic" is a routine way of life. If our attention is on something other than what we are doing for most of our lives we can come to feel empty and numb. As automatic thinking dominates our subjective sense of the world, life becomes repetitive and dull. Instead of experience having an emergent feeling of fresh discovery, as a child sensing the world for the first time, we come to feel dead inside, "dead before we die." Living on automatic also places us at risk of mindlessly reacting to situations without reflecting on various options of response. The result can often be knee-jerk reactions that in turn initiate similar mindless reflexes in others. A cascade of reinforcing mindlessness can create a world of thoughtless interactions, cruelty, and destruction.

Being mindful opens the doors not only to being aware of the moment in a fuller way, but by bringing the individual closer to a deep sense of his or her own inner world, it offers the opportunity to enhance compassion and empathy. Mindfulness is not "self-indulgent," it is actually a set of skills that enhances the capacity for caring relationships with others.

Mindfulness heightens the capacity to become filled by the senses of the moment and attuned to our own state of being.

As we also become aware of our awareness, we can sharpen our focus on the present, enabling us to feel our feet as we travel the path of our lives. We engage with ourselves and with others, making a more authentic connection, with more reflection and consideration. Life becomes more enriched as we are aware of the extraordinary experience of being, of being alive, of living in this moment.

COAL AND KIND AWARENESS

In addition to this reflective awareness of awareness in the present moment, mindfulness has the following qualities that I describe for my patients and students: We approach our here-and-now experience with curiosity, openness, acceptance, and love (COAL). (See Appendix II for additional terms.)

Imagine this situation. Let's say one stubs one's toe badly and feels the intensity of the pain. Okay, one might say, I am "mindful" of that pain. Now if one said inside one's head, "What an idiot I was for stubbing my toe!" the mental suffering experienced will be greater than only the pain emanating from one's toe. In that eventuality, one is aware of the pain, but one is not filled with the COAL mindset. In this case, one's brain actually creates more suffering by amplifying the intensity of the pain with self-blame for having the accident. This is all the difference between intensifying the distress versus coming to feel the pain without suffering.

The essayist, naturalist, and poet Diane Ackerman told the story at our Mind and Moment gathering of poets, practitioners, and psychotherapists about a time when she had an accident in Japan and nearly died (see Appendix I for an explanation of this and other conferences and organizations on mindfulness). She had been climbing down a cliff to study some rare birds on a small island and fell, breaking several ribs and painfully struggling to breathe. Her description of the event (Ackerman, Kabat-Zinn, O'Donohue,

& Siegel, 2006) revealed how she approached the moment-to-moment encounter with curiosity, openness, acceptance, and love. This mindset enabled her to learn from the event, to gather the internal strength she needed to hold on, literally, and to not only survive in spite of the accident, but to thrive because of it.

This distinction between awareness with COAL and just paying attention with preconceived ideas that imprison the mind, (“I shouldn’t have hit my foot, I’m so clumsy” “Why did I fall off this cliff? What is wrong with me!”) is the difference that makes all the difference. This is the difference between being aware, and being mindfully aware.

Cultivating mindful awareness requires that we become aware of awareness *and* that we be able to notice when those “top-down” preconceptions of shoulds and ought-to’s are choking us from living mindfully, of being kind to ourselves. The term *top-down* refers to the way that our memories, beliefs, and emotions shape our “bottom-up” direct sensation of experience. Kindness to ourselves is what gives us the strength and resolve to break out of that top-down prison and approach life’s events, planned or unplanned, with curiosity, openness, acceptance, and love.

Research into mindful awareness suggests that we can indeed cultivate such love for ourselves. Our approach to mindfulness as a form of relationship with oneself may hold a clue as to how this is accomplished. With mindfulness seen as a form of intrapersonal attunement, it may be possible to reveal the mechanisms by which we become our own best friend with mindful practice. We would treat our best friend with kindness, after all. Attunement is at the heart of caring relationships of all sorts: between parent and child, teacher and student, therapist and patient/client, lovers, friends, and close professional colleagues.

With mindful awareness, we can propose, the mind enters a state of being in which one’s here-and-now experiences are sensed directly, accepted for what they are, and acknowledged with kindness and respect. This is the kind of interpersonal attunement that

promotes love. And this is, I believe, the intrapersonal attunement that helps us see how mindful awareness can promote love for oneself.

Interpersonal relationships have been shown to promote emotional longevity, helping us achieve states of well-being and medical health (Anderson & Anderson, 2003). I am proposing here that mindful awareness is a form of self-relationship, an internal form of attunement, that creates similar states of health. This may be the as yet unidentified mechanism by which mindfulness promotes well-being.

MEDICAL APPLICATIONS

Sensing the profound importance of the power of mindfulness, Jon Kabat-Zinn, in the late 1970s, began a project to apply these ancient ideas in a modern medical setting. What began as an inspiration during a silent retreat led to Kabat-Zinn's approach to the medical faculty at the University of Massachusetts Medical Center where he taught. Could he take on patients whose situations could no longer be helped by conventional medical interventions? Could he add anything at all to the recovery of those patients who were treated by conventional means? Glad to have a place where these individuals might find some relief, the medical faculty agreed and the beginnings of the Mindfulness-Based Stress Reduction (MBSR) clinic were initiated (Kabat-Zinn, 1990).

The MBSR program brought the ancient practice of mindfulness to individuals with a wide range of chronic medical conditions from back pain to psoriasis. Kabat-Zinn and colleagues, including his collaborator Richard Davidson at the University of Wisconsin in Madison, were ultimately able to demonstrate that MBSR training could help reduce subjective states of suffering and improve immune function, accelerate rates of healing, and nurture interpersonal relationships and an overall sense of well-being (Davidson et al., 2003).

MBSR has now been adopted by hundreds of programs around the world, and research has demonstrated that its use has brought about physiological, psychological, and interpersonal improvements in a variety of patient populations (Grossman et al., 2004). With these consistent findings being so robust, and a rising interest in mindful awareness practices, it wasn't surprising that my own field of mental health would take note and integrate the essence of mindfulness as a basis for approaching individuals with psychiatric disorders.

DISCERNMENT & MENTAL HEALTH IMPLICATIONS

Mindfulness has influenced a wide range of approaches to psychotherapy with new research revealing significant improvements in various disorders with reduction in symptoms and prevention of relapse (Hayes, Follette, & Linehan, 2004; Hayes, Strosahl, & Wilson, 1999; Linehan, 1993; Marlatt & Gordon, 1985; Parks, Anderson, & Marlatt, 2001). Mindfulness can also prevent relapse in cases of chronic depression via cognitive therapy (Segal, Williams, & Teasdale, 2002). Similarly, mindfulness has been used as an essential part of the treatment of borderline personality disorder in dialogical behavior therapy (DBT; Linehan, 1993). Relapse prevention in individuals with substance abuse is also a part of the skills taught by Marlatt and colleagues (2001). The principles of mindfulness are also inherent in the application of contemporary behavior analysis in acceptance and commitment therapy (ACT; Hayes, 2004). One of the first studies to demonstrate that psychotherapy can alter the function of the brain utilized mindfulness principles in the treatment of individuals with obsessive-compulsive disorder (Baxter, Schwartz, Bergman, Szuba, Guze, Mazziotta, et al., 1992). Several books have now been published that review the use of mindfulness and acceptance in the psy-

chotherapy of a wide range of conditions from eating disorders to anxiety, posttraumatic stress disorder, and obsessive–compulsive disorders (Hayes, Folette, & Linehan, 2004; Germer, Siegel, & Fulton, 2005; Segal, Williams, & Teasdale, 2002).

The general idea of the clinical benefit of mindfulness is that the acceptance of one's situation can alleviate the internal battle that may emerge when expectations of how life should be do not match how life is (Brach, 2003; Hayes, 2004; Linehan, 1993a). Being mindful entails sensing what is, even sensing your judgments, and noticing that these sensations, these images, feelings, and thoughts, come and go. If you have a COAL stance, the rest takes care of itself. There is no particular goal, no effort to “get rid” of something, just the intention to be, and specifically, to experience being in the moment as one lets go of grasping onto judgments and goals.

Emerging from this reflective COAL mindful way of being is a fundamental process called “discernment” in which it becomes possible to be aware that your mind's activities are not the totality of who you are.

Discernment is a form of disidentification from the activity of your own mind: As you become aware of sensations, images, feelings, and thoughts (SIFT) you come to see these activities of the mind as waves at the surface of the mental sea. From this deeper place within your mind, this internal space of mindful awareness, you can just notice the brain waves at the surface as they come and go. This capacity to disentangle oneself from the chatter of the mind, to discern that these are “just activities of the mind,” is liberating and for many, revolutionary. At its essence, this discernment is how mindfulness may help alleviate suffering.

Discernment also gives us the wisdom of how to interact with each other with more thoughtfulness and compassion. As we develop kindness toward ourselves, we can be kind to others. By get-

ting beneath our automatic mental habits, we are freed to engage with each other with a deeper sense of connection and empathy.

MINDFUL TEACHING AND THERAPY

A mindful approach to therapy and to education involves a shift in our attitude toward the individuals with whom we work. The active involvement of the student in the learning process enables the teacher to join as a collaborative explorer in the journey of discovery that teaching can be: We can embrace both knowledge and uncertainty with curiosity, openness, acceptance, and kind regard. The teacher does not have to be a source of the illusion of absolute knowledge. Together, educator and student can face the exciting challenge of developing a scaffold of knowledge that embraces the nature of knowing and its inherent context dependence and subtle sources of novelty and distinction.

Viewing an individual in psychotherapy in similar terms may seem new for some therapists. In wrestling with what terms to use in their book on mindfulness and psychotherapy, Germer, Siegel, and Fulton (2005) wrote, “Part of stitching this book together was to arrive at a consistent use of the word ‘client’ or ‘patient.’ Our profession has not settled that discussion yet, and we will not either. However, after some exploration, we decided upon ‘patient.’ Etymologically, patient means ‘one who bears suffering,’ while client means ‘one who puts himself under the protection of a patron.’ Since doctor means ‘teacher,’ it can be said that we are doctoring patients, or ‘teaching people who bear suffering.’ This meaning is parallel to the original use of mindfulness 2,500 years ago: It is a teaching that alleviates suffering” (p. xv).

With this in mind, we shall also use the term “patient” in this text. This discussion also leads us to the ways in which we’ll be addressing both psychotherapy and education as two areas of application of these ideas about the mindful brain. Mindfulness has

direct implications for improving people's lives in the classroom and in the clinical setting in addressing various medical and psychological stressors and illnesses.

In their journey to discover an effective approach to treat the important and widespread condition of chronic depression, the renowned cognitive therapists Zindel Segal, Mark Williams, and John Teasdale became intrigued with mindfulness as a skill that might be useful in their efforts (Segal, Williams, & Teasdale, 2002). Initially seeing the benefits of this approach as being a part of attentional skill training, they soon found that the mindful presence of the therapist played a crucial role in the efficacy of the treatment. Their consultations with Kabat-Zinn's Mindfulness Based Stress Reduction (MBSR) clinic led to the ultimate shifting of their emphasis and the creation of Mindfulness Based Cognitive Therapy (MBCT), which proved to be the first demonstration of a form of psychotherapy that could prevent relapse in those with chronic depressive episodes. Their description of this shift is illuminating:

In our own training, we had been taught that when faced with a difficult clinical problem, we should collaborate with the patient on how best to solve it by seeing what thoughts, interpretations, and assumptions might be causing or exacerbating the problem. We anticipated taking the same approach in developing attentional control training, bolting mindfulness techniques onto this basic therapy framework. However, it became clear from our later visits to the Stress Reduction Clinic that unless we changed the basic structure of our treatment, we would continually revert to dealing with the most difficult problems by searching for more elaborate ways to fix them. Instead, it now appeared to us that the overarching structure of our treatment program needed to change from a mode in which we were therapists to a mode in which we were instructors. What was the difference? As therapists, coming as we did from the cognitive-behavioral tradition, we felt a responsibility to help patients solve their problems, "untie the knots" of their

thinking and feeling, and reduce their distress, staying with a problem until it was resolved. By contrast, we saw that the MBSR instructors left responsibility clearly with the patients themselves, and saw their primary role as empowering patients to relate mindfully to their experience on a moment-by-moment basis. (p. 59)

Embracing the acceptance and discernment of mindfulness as a therapist enables us to become a fellow traveler on this uncertain path of life. Similarly, as a teacher we can join with the student in viewing the world through the lens of creative uncertainty that deeply acknowledges the ever-changing landscape of both the external and internal worlds of our dynamic lives.

WHY THE MINDFUL BRAIN?

By exploring potential mechanisms in the brain that correlate with mindfulness, it becomes possible to see the connection among our common everyday view of mindfulness, the educational use of cognitive mindfulness concepts, and the clinical use in medical and mental health practices of reflective mindful awareness. These sometimes intermixed uses of the term *mindfulness*, while quite distinct in practice, may actually share common neural pathways. Illuminating these neural mechanisms associated with cognitive and reflective mindfulness might then assist us in expanding our scientific understanding further, opening the doors for asking specific, testable questions. Such neural insights may also shed light on how to design and implement practical applications of mindfulness in ways we have not yet imagined. By revealing how mindfulness harnesses our social neural circuitry, we may be able to extend our understanding of its impact on physiological and psychological well-being.

Another important dimension of looking toward the mindful brain is that by understanding the neural mechanisms associated with mindful awareness, we may be in a better position to identify

its universal human qualities and make it more accessible and acceptable to a broader audience. We all share the brain in common. Can you imagine a world in which this health-promoting, empathy-enhancing, executive-attention developing, self-compassion nurturing, affordable, and adaptable mental practice was made available in everyone's life?

HOW DO WE KNOW?

In preparing to explore these issues, I have become involved in two ways of knowing: experiential and experimental. I have participated in a number of intensive and direct immersions in mindful awareness in order to sense the power of this important way of being in life. That aspect of the journey, which I will discuss, enables us to view the inner dimension of mindfulness from the inside out. The second way of knowing is equally as powerful, but different: This is the scientific perspective on mindful awareness.

I was invited to teach at a summer research program sponsored by the Mind and Life Institute, which has been pursuing the integration of science and meditation under the leadership of the Dalai Lama. Representatives of other practices, including Christian centering prayer, Taoist tai chi, and yoga attended the Institute: There are many ways to pursue the training of mindful awareness. I was on a panel discussing the clinical applications of mindfulness and the transformation of affect by means of meditation. Before starting, I wanted to get a sense of how much basic neuroanatomy the audience knew so that I could gear the details of my remarks. When I asked, "Who here knows how the brain works?" one of my panel partners, the renowned researcher of affective neuroscience, Richie Davidson, replied "None of us!" We all laughed and realized how correct he was.

The brain is a complex system, and we really don't "know" fully how it works, or indeed how exactly its functions relate to the

subjective nature of mind, much less how mindful awareness works. But we do have many fascinating hints as to the interplay of mental experience and brain structure and function. Brain function and mental life are not identical entities. When it comes to exploring mindful awareness, we need to be very humble about saying what we know about the brain's role. But turning with an open mind to the neural aspects of mindfulness can only help shed light onto the associated processes and means of cultivating this important dimension of our subjective lives, an illumination that might further enhance the objective nature of our bodies, relationships, and psychological well-being.

We can say that mind and brain correlate their functions, but we actually don't know the exact ways in which brain activity and mind function mutually create each other. It is too simplistic to say merely that the "brain creates the mind" as we now know that the mind can activate the brain. The process that regulates the flow of energy and information, our definition of the mind, can directly stimulate brain firing and ultimately change the structural connections in the brain.

We can look to the brain for correlations with mental processes, like mindful awareness. These associations are just that: not causal proofs, but two dimensions of reality that ultimately cannot be reduced to each other. For example, Davidson et al. (2003) have demonstrated a shift of brain function to *left* frontal dominance in response to emotion triggers that are associated with an approach state of mind with more positive emotion, as we'll explore in detail in Chapter 10. This left shift in emotion-regulating circuits was directly correlated with the degree of improved immune function. Another study by Lazar, Kerr, Wasserman, Gray, Greve, & Treadway (2005) revealed an increased thickness of two parts of the brain: (1) the middle prefrontal area, bilaterally, and (2) a related neural circuit, the insula, which was particularly thicker on the right side of the brain. The degree of thickness in these areas was correlated with length of time spent practicing mindfulness medi-

tation. Here we see both a left-sided and a right-sided correlation with mindful awareness practices (see Appendix III on laterality). Studies of other forms of meditation, such as focusing on compassion, reveal yet other changes, such as increased coordination of firing, especially in the prefrontal areas on both sides of the brain (Lutz, Greischar, Rawlings, Ricard, & Davidson, 2004). An extensive review of many studies (Cahn & Polich, 2006) reveals a range of activations, especially in middle prefrontal areas (anterior cingulate), with mindfulness meditation.

One benefit of turning to the brain for correlations with the mind is that we can actually learn more about the mind itself. In examining the mindful brain, we'll not only review these and other studies of emotion, attention, and executive functions, but we'll be diving into the new territory of social neuroscience. Seeing mindful awareness also as a self-relationship that harnesses the neural circuitry of our social lives may shed new light on the fundamental processes within the experience of mindfulness.

Preliminary research involving brain function hints at the view that mindfulness changes the brain. Why would the way you pay attention in the present moment change your brain? How we pay attention promotes neural plasticity, the change of neural connections in response to experience. What we'll examine are the possible mechanisms of how the various dimensions of mindful awareness emerge within the activity of the brain and then stimulate the growth of connections in those areas. By diving deeply into direct experience, we will be able to shed some light on why research might reveal left-sided changes, right-sided changes, and global impacts on integrative functioning in the brain as a whole.

MINDFULNESS AS A RELATIONSHIP THAT PROMOTES INTEGRATION

Long before we spent time cultivating our minds with reflection, we evolved as social creatures. A great deal of the process

of our brains at rest, in default mode, appears to be neural circuitry correlated with understanding others (Gusnard & Raichle, 2001). It is the social circuits of the brain that we first used to understand the mind, the feelings and intentions and attitudes of others. When we view mindful awareness as a way of cultivating the mind's awareness of itself, it seems likely that it is harnessing aspects of the original neural mechanisms for being aware of other minds. As we become aware of our own intentions and attentional focus, we may be utilizing the very circuits of the brain that first created maps of the intention and attention of others. COAL is exactly what parents who provide secure attachment to their children have as a mental stance toward them. We can propose that the interpersonal attunement of secure attachment between parent and child is paralleled by an intrapersonal form of attunement in mindful awareness. Both forms of attunement promote the capacity for intimate relationships, resilience, and well-being (see Chapter 9 for further discussion of attachment).

The outcome measures for studies of secure attachment, and those for mindful awareness practices, have markedly overlapping findings (Kabat-Zinn, 2003b; Sroufe, Egeland, Carlson, & Collins, 2005). I found, too, that many of the basic functions that emerged in these two seemingly different entities were associated with the prefrontal cortex. These functions include regulation of body systems, balancing emotions, attuning to others, modulating fear, responding flexibly, and exhibiting insight and empathy. Two other functions of this prefrontal region, being in touch with intuition and morality, had not been studied in attachment work but did seem to be an outcome of mindful awareness practices (see Appendix III, Middle Prefrontal Region).

The proposal that my colleagues and I had made earlier (see Cozolino, 2002; Schore, 2003a, 2003b; Siegel, 1999, 2001b; Siegel &

Hartzell, 2003; Solomon & Siegel, 2003) was that the relationships of secure attachment between parent and child, and the effective therapeutic relationship between clinician and patient each promoted the growth of the fibers in this prefrontal area.

Prefrontal function is integrative. What this means is that the long strands of the prefrontal neurons reach out to distant and differentiated areas of the brain and body. This linkage of differentiated elements is the literal definition of a fundamental process, *integration*. For many reasons, discussed elsewhere, integration can be seen as the underlying common mechanism beneath various pathways leading to well-being (Siegel, 1999, 2001b, 2006, in press).

How Does Attunement Promote Integration?

When relationships between parent and child are attuned, a child is able to feel felt by a caregiver and has a sense of stability in the present moment. During that here-and-now interaction, the child feels good, connected, and loved. The child's internal world is seen with clarity by the parent, and the parent comes to resonate with the child's state. This is attunement.

Over time, this attuned communication enables the child to develop the regulatory circuits in the brain—including the integrative prefrontal fibers—that give the individual a source of resilience as he or she grows. This resilience takes the forms of the capacity for self-regulation and engagement with others in empathic relationships. Here we see that interpersonal attunement—the fundamental characteristic of a secure attachment—leads to the empirically proven outcome measures we described above.

This list of nine prefrontal functions also seemed to overlap with what I was coming to learn about mindfulness practice. I presented this idea to Jon Kabat-Zinn on a discussion panel (Ackerman, Kabat-Zinn, & Siegel, 2005) and he confirmed the accuracy of the observation of these as outcome measures. He went on to

extend the idea that this list is not just about research-verified outcomes, but it is about the process of mindful living itself.

The excitement of finding a convergence between research in attachment and in mindfulness has driven me to explore this overlap further. Since that first meeting I have come to learn more about mindful practice from direct experience and my own clinical applications as well as by immersing myself in a series of retreats and research institutes as a participant and as a faculty member. The journey to learn about these ways of cultivating the mind and well-being has been thrilling and mind-opening.

In the chapters ahead we'll explore this journey into the mind and examine what mindful awareness, secure attachment, and pre-frontal brain function could have in common.