

Chapter 5

The Spectrum of Human Awareness

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We are not human beings having a spiritual experience; we are spiritual beings having a human experience.

—Pierre Teilhard de Chardin

From the moment we are born, the human brain has the remarkable ability to constantly change itself. Think about who you are today and who you were a decade ago, or even last year or last month. Although you are the same person, you have learned new skills, had new experiences, and let go of old beliefs and habits that no longer have relevance to your life. We call this process of changing and reaching beyond your current self, “self-transcendence.”

Physically, your brain is constantly changing as billions of neurons slowly rearrange their connections in a vast “soup” of neurochemical and neuroelectrical activity. Different electrolytes migrate through the envelope of each neuron telling it when to rest or take action, and as the activity changes, so do our thoughts and feelings. Throughout the day, different patterns of brain activity occur, generating different states of mind. Various neurotransmitters are also released when we engage in different tasks, and each one can alter our behavior and mood. But what happens when your brain experiences Enlightenment? A growing number of studies have begun to explore what happens when you have a sudden insight, and these “aha” moments—as neuroscientists often refer to them—can help explain how the little “e” experiences of enlightenment influence the brain. Brain-scan research shows that there is a rapid shift of neural activity in several key areas of the brain during sudden insights.¹ Our rational mind is interrupted, our sense of self is altered, and a different form of conscious awareness emerges. We see problems differently, we intuitively find solutions in ways that feel surprisingly mysterious, and in that moment, our knowledge and beliefs can change. So it’s fair to argue that the path to Enlightenment begins the moment we suspend our normal view of the world.

Some intuitional insights can be intense and bring great clarity, but they do not always radically alter a person’s belief system or create a *permanent* change in behavior or in the function of the brain, elements that we consider to be the neurological correlates of Enlightenment. But when we combine the information from the brain-scan studies of “aha” moments of creative insight with our brain-scan studies of intense spiritual practices, we can begin to unlock the biological basis of the big “E” experiences.

How Your Brain Gets You to Enlightenment

We have identified five key elements of Enlightenment: a sense of intensity, unity, clarity, and surrender and a permanent large-scale change in our awareness, behavior, or belief system. The little “e”

experiences can include any of the first four elements, and the process can be spontaneously triggered (meaning that we are not consciously aware of what brought it about) or deliberately sought through the practices of contemplation, self-reflection, meditation, prayer, or a variety of spiritual disciplines aimed at disrupting our ordinary view of life.

When a person chooses to seek Enlightenment through a specific practice—be it Eastern or Western, religious or secular—activity initially begins to increase in the frontal lobe when she begins to meditate or immerse herself in contemplative reflection. The greater the increase, the more *clarity* we have, allowing us to feel in control and purposeful about our actions and behaviors.

We also see in our brain-scan studies an initial increase in activity in the parietal lobe. Our awareness of our self in relation to the world or object of meditation is increasing, and parietal activity helps us to identify our goal and move toward it.

These initial increases in activity in the frontal and parietal lobes also reduce the emotional intensity of our feelings. This helps us to feel more grounded, centered, and in control, but it doesn't lead to Enlightenment. If, however, there was a sudden and substantial decrease in activity in the frontal and parietal lobes, we would experience a loss of control (surrender), our sense of self would weaken or even disappear, and a dramatic increase of emotion would make the experience feel extraordinarily real.

This is what we've seen in our brain-scan studies. Sometimes when a person is deeply immersed in an intense prayer, meditation, or spiritual practice, there will be a sudden and dramatic decrease in neural activity in the frontal and parietal lobes. This is when our subjects are most likely to describe incredible shifts of perception and experiences of unity consciousness, which are essential parts of the Enlightenment experience. If increased frontal lobe activity helps you to feel in control of your actions, then decreased activity would likely result in a feeling of surrender—another key element of Enlightenment—and if increased parietal lobe activity helps to give you a sense of yourself as a separate entity, then decreased activity would give you the sense that “you” are dissolving and becoming one with everything else in the world, even God. This is where the profound insights associated with Enlightenment begin to enter consciousness.

But how do you distinguish the neurological differences between big “E” and little “e” experiences? “Aha” moments are often very brief, and the increases and decreases in neural activity are rather small. This suggests that the greater the shift in neural activity, the more dramatic the experience will be. When I analyzed the changes in neural activity from all the different spiritual practices we've studied, a certain pattern emerges: the larger the decrease in frontal and parietal activity, especially when they had an initial increase, the more likely the participants were to describe experiences that reflect most of the five elements of Enlightenment.

Let me describe this neurological process with the following metaphor. Imagine that you are slowly climbing two flights of stairs. That's the basic contemplative process during which your frontal and parietal activity slowly increases. You're becoming more conscious, more focused, and more observant of yourself and the world with each step you take. Keep in mind that typically, when you are awake, activity in the brain doesn't change much, perhaps 5 to 10 percent throughout the day. But while the brain is engaged in some of the more esoteric and mystical practices we will be describing in the next section of this book, we see changes approaching 20 percent or more. So clearly you can increase your consciousness and clarity at will.

Now imagine that you quickly run back down the stairs. You'll probably feel a nice rush of energy, like the “runner's high” you get after a good workout, as you come back down to where you started. The same thing usually occurs after you meditate or pray: your brain activity returns to its baseline or resting state. You might feel invigorated and calm, but you probably won't feel Enlightened or transformed.

Then imagine climbing up those twenty feet of stairs—about the height of a diving platform—and jumping off the edge into a swimming pool below. You're descending much more rapidly than running down the stairs, and the experience would feel more intense. That's what happens when your frontal lobe experiences a rapid 20 percent drop in activity. This might resemble a very intense spiritual practice, maybe lasting an hour, and it may even lead you to some new insight or strong feeling of blissfulness—a

little “e” experience—but it’s not enough yet to trigger a profound shift in your behavior or overall belief system. You had an exhilarating time as you were diving, but your reality didn’t change. In this analogy, you are still in the air the entire time -- your world has not yet changed.

Now imagine a slightly different scenario where you are standing on a ledge twenty feet above the ocean (the 20 percent increase from your contemplative practice). But then you accidentally slip. Remember, all of the Enlightenment experiences we’ve reported so far happened unexpectedly to the person even when they weren’t purposely striving for them. You feel yourself rapidly falling to the sea (a 20 percent drop in frontal and parietal activity, which is actually similar to what happens in your brain when you are in a life-threatening situation: your sense of self-control disappears as your survival instincts kick in). Again though, you are still in the air. You are still in your prior experience of reality. This all changes when you hit the water. You go from being dry to being wet, from experiencing the world in one way to an entirely different experience. At first, the water doesn’t slow your descent as you plummet another twenty feet into the blackness (another 20 percent decrease in neural activity). You are in the depths of the water—an unfamiliar reality—and you can’t see anything familiar. This is when we believe you are most likely to experience Enlightenment. Your brain has experienced a 40 percent drop in activity (from the top to the bottom), consciousness is radically changed, and you have no choice but to surrender yourself to the experience. This is how I felt when I was immersed in that sea of Infinite Doubt. I didn’t jump. I didn’t ask for it. I simply gave up and let the currents take me to the insights that seemed to come from out of the blue.

Spiritual Practices Prime the Brain for Enlightenment

Eastern philosophies placed great emphasis on intense experiences that transcended logic and gave the person a mystical sense of connectedness with the universe. Thus intense spiritual practice offered the promise of Enlightenment. However, in the West, the Age of Enlightenment was actually anti-enlightenment, at least in any kind of spiritual or supernatural sense. Descartes, for example, would argue that intense feelings of unity and surrender were suspect and needed to be rationally dissected and analyzed in order to arrive at a more simple truth that could be measured by the tools of science.

Mainstream religions in the West were also suspicious of anyone who claimed to experience unity with God, and most mystics were persecuted as heretics. However, the Pentecostal movement that began in the early 1900s, along with the Charismatic movement that followed in the 1960s, changed the course of Christianity. Today over five hundred million people—a quarter of the Christian world²—deliberately surrender themselves to becoming one with the Holy Spirit. Our recent brain- scan research with some of these individuals shows that they can take conscious control over their own brain to enter states that meet nearly all of our criteria for Enlightenment.

We studied a group of Pentecostals who engaged in a practice called “speaking in tongues.” First, they began to sing and dance as gospel music was played. This was associated with increased frontal lobe activity, but when they began to speak in tongues, activity suddenly dropped in the frontal lobe. They immediately felt an intense sense of unity with something beyond themselves—the Holy Spirit—and as they surrendered themselves to the ecstatic experience, they felt transformed and healed. One of our survey participants described her first experience of speaking in tongues this way:

I was alone and praying and, without warning, spoke a while in a language I didn’t recognize. It was a joyful sound and was a lovely experience and I knew for certain that the Holy Spirit was real, available to me whenever I needed. I couldn’t control it, but if I could, I would speak in tongues often!

We also found a drop in frontal lobe activity when we examined Sufi practitioners who engaged in a powerful chanting and movement meditation known as Dhikr. One of our Sufi subjects described the experience of leaving his own body and observing himself from the outside, not unlike the descriptions from people who have near-death experiences.

Many other practices can trigger similar changes, but no matter how it happens, when your frontal lobe activity drops suddenly and significantly, logic and reason shut down. Everyday consciousness is suspended, allowing other brain centers to experience the world in intuitive and creative ways.

Decreases in the parietal lobe activity can also allow a person to have intense feelings of unity consciousness. We saw this in our studies of advanced meditators and people who engaged in various forms of contemplative prayer. But it usually took about fifty to sixty minutes before they felt merged with the object of their contemplation. Our Buddhist subjects described the sensation as becoming one with pure consciousness. The Franciscan nuns in our study felt a sense of unity and connectedness with Jesus or God. These are two entirely different practices, but the unity experience affected the same areas in everyone's brains. This decrease appears to occur even during small moments of insight³ but is strongest during spiritual practices and powerful Enlightenment experiences.

In our brain-scan studies of various spiritual practitioners, we also saw changes in the thalamus, a central structure that helps us to build reality models of the world. We saw activations in the thalamus during specific practices like prayer and meditation, and we also saw long-term changes in the function of the thalamus in people performing contemplative practices over many years. The more frequently a person engages in meditative self-reflection, the more these reality centers change.⁴ Colors can become more vibrant, our empathic feelings toward others can increase, and the way we literally experience the world can become more pleasurable or intense. As one twenty-four-year-old research technician said:

I once had an experience of extreme light and clarity. My whole body was vibrating for several hours with a light energy that made me see who I was, how I fit in the world, and what fabric was really underlying the physical world in a profoundly new way.

How to Visualize the Enlightenment Circuit in Your Brain

Here's a way to help you visualize what happens in the brain when you have an Enlightenment experience. Open up your right hand and imagine placing a walnut on your palm. Now make a fist. The walnut is your thalamus, the part of your brain that receives most of your sensory input and also helps other parts of the brain communicate with one another. Your fist is the emotional center of your brain, and your forearm is your spinal cord. These are the most ancient structures of your brain.

Now take your left hand, spread your fingers apart, and place it over your fist (thumb touching thumb and fingers touching fingers). Your left hand represents your neocortex and its four major lobes. The knuckles of your left hand represent your parietal lobe, which gives you a sense of yourself and different objects in the world, and the palm of your left hand symbolizes your frontal lobe, which controls your conscious decision-making processes. All of these areas of your brain send millions of axons into most of the other areas represented by your fingers, palms, and the walnut inside your fist. In fact, there's so much interconnectivity that you can't precisely say where one part of the brain begins or ends. With each task you perform, you'll see increased activity in some areas and decreased activity in other parts.

Now let's make the image more "real" for your mind to grasp. Take the thumb and forefinger of each of your hands and place them around the circumference of your head. Put your forefingers on the areas right above your eyes, and your thumbs on the back part of your head just above your ears. Your forefingers are touching a very special part of your frontal lobe: your dorsolateral prefrontal cortex. This is the area most active when you are thinking about anything or focusing attention on a specific task like solving a math problem.

Your thumbs are resting on your parietal lobe, where your sense of self originates. Normally, there's a constant dialogue going on between your frontal and parietal lobes. If activity suddenly increases or decreases in either area where your thumbs and forefingers are located, everyday consciousness is radically changed. Your sense of self can expand or contract. You can feel disconnected from reality or unified with it.

The Spectrum of Human Awareness

One of the basic components of the Enlightenment experience, associated with the profound shifts in brain activity, is the radical shift from one state of consciousness to another state, allowing us to see a different view of reality. Consciousness is a difficult concept to describe, but it is essential for understanding Enlightenment. To help with this concept, we have developed a model describing a number of levels of awareness that our brain is capable of generating.

Before describing that model, I want to try to clarify the difference between consciousness and awareness. Many scientists and philosophers use these terms interchangeably, while others attribute unique qualities to each of these subjective states of mind. But when you review the neuroscientific literature, there are actually some important distinctions between them. We are suggesting that awareness is the bigger picture, one that encapsulates many different forms of conscious and unconscious behaviors.

Most biologists would agree that awareness is something that exists in almost every living organism. Even an amoeba moves toward food, suggesting some basic type of awareness of its environment. With the development of the central nervous system in animals, more complex forms of awareness allow animals to voluntarily respond to the environment in more sophisticated ways. This form of awareness involves many parts of the brain.

At some point, the brain develops the capacity to become aware of its own cognitive processes, and that is what we are calling “*consciousness*,” a neurological process that is dependent on—and may be limited to—small areas in the frontal and parietal lobes. When you are *consciously* observing yourself and the world, you become aware that you are a *person*, a unique entity capable of reflecting on your past circumstances and making decisions that will influence your present and future life. You understand, and are aware, that you are you.⁵

Simply put, you can have awareness without consciousness, but you cannot have consciousness without awareness.

Most animals have some awareness of their self and are able to distinguish that self from other animals and the rest of the world. This is why they won't eat their own leg but rather the leg of another animal. This too is a rudimentary form of self-consciousness. In fact, new brain-scan research shows that many birds or mammals that have structures similar to our frontal and parietal lobes can be consciously self-aware. In fact, dogs have many of the same qualities of consciousness that humans have.⁶ This leaves open the possibility that some animals are capable of having “aha” experiences and insights that allow them to alter some of their behavior.⁷ However, there is little evidence showing that nonhumans have the ability to radically and permanently change their belief systems, or engage what scientists call “theory of mind”⁸—the ability to understand what another individual is thinking. We also find no evidence showing that animals can consciously alter any structures in the brain associated with the elements of Enlightenment. However, particular animal rituals, like mating rituals, alter the animal's awareness of its own self so that it can connect with another animal. And a similar process occurs in human beings.

Awareness gives birth to consciousness, and consciousness can be enhanced through different practices and rituals. Through these practices, we become more aware of the overall environment and ourselves, including our *unconscious* thoughts, feelings, and perceptions.

But consciousness is also limited by the brain's propensity to rely on old behaviors and beliefs. What

if we could “transcend” the limitations of everyday consciousness, as the mystics suggest? Perhaps we can enter higher stages of awareness that allow us to glimpse greater truths about reality. Is it possible for people to tap into new levels of sensory experience that would expand their awareness of the world? Perhaps! That is why we are proposing a neurological model to include the possibility of Enlightenment.

Based on our analysis of the last twenty years of neuroscientific research on learning, memory, emotions, cognition, and behavior, along with our own studies of spiritual experiences, we have identified six “levels” of awareness:

- Level 1: Instinctual Awareness
- Level 2: Habitual Responsiveness
- Level 3: Intentional Decision Making
- Level 4: Creative Imagination
- Level 5: Self-Reflective Awareness
- Level 6: Transformational Awareness

Each level is associated with activity in different regions of the brain, as the following diagram shows. With this map, we can now trace how awareness emerges in the primitive nervous system of a worm⁹ and culminates in the Enlightenment experience of a human.

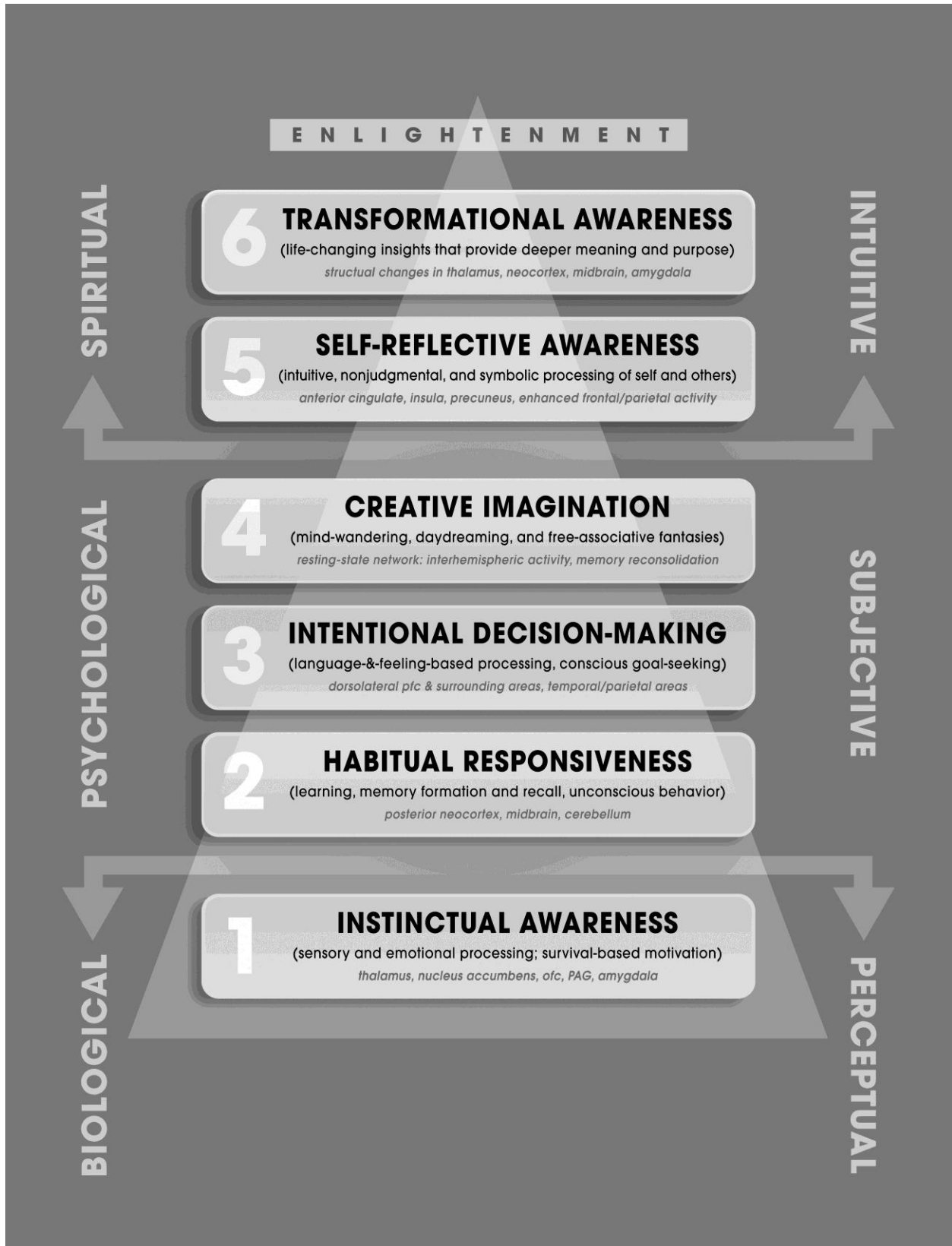
A Brief Summary of the Levels of Human Awareness

Our brain often engages several levels of consciousness and awareness at the same time, but we spend most of that time in the lower levels of instinct, habit, and conscious decision making. For example, you wake up in the morning feeling hungry (Level 1, instinct). You automatically put on your robe and walk to the kitchen, barely aware of anything (Level 2, habit). You open the fridge and decide what you’d like to eat (Level 3, decision making). That’s about it. Maybe you’ll be inspired to make something new for breakfast (Level 4, creativity), but I doubt that you’ll spend much time deeply reflecting on the meaning and purpose of your daily routine for getting up (Level 5, self-reflective awareness). Your beliefs are the same, your behavior is predictable, and your worldview will not have changed (Level 6, transformational awareness).

If you are like most busy people, you probably gobbled down your food and rushed out the door, hoping that you wouldn’t be late for work. Not much awareness there, but what if you engaged in a practice called mindful eating, where you savored each tiny bite of your food? We recently did a brain-scan study on mindful eating and discovered that there are some very unique neurological changes that take place. When you eat super slowly, food tastes surprisingly different. For one of our test subjects, desserts began to taste slightly unpleasant, and the experience was so shocking that he eliminated sweets from his diet. Eating slowly made him more self-aware (Level 5), and the change in behavior probably lengthened his life (he was pre-diabetic). We would consider this a little “e” experience because it had the elements of surrender (he immersed himself in the experience of eating slowly), intensity (the flavors were accentuated), and clarity (he realized he didn’t like what he normally ate), and it changed his behavior (his beliefs about what tasted good were challenged by the mindful eating experience).

With Enlightenment comes increased awareness, but this example demonstrates that even during ordinary activities, we can deliberately alter our awareness to experience the world in very different and beneficial ways. In other words, increased awareness is a key path to Enlightenment.

Enlightenment requires that we take time to access our intuitive centers of creativity and awareness and to deeply reflect on those things that give our lives meaning, purpose, and value (Levels 4 and 5). The more you understand how to shift between the different levels of the Spectrum of Human Awareness, the more you are likely to experience Enlightenment. Let’s explore the different levels in more detail.



LEVEL 1: INSTINCTUAL AWARENESS. It begins the moment we wake up and voluntarily respond to our inner and outer needs. This basic level of human awareness is mostly unconscious and is governed by our emotions and our pain-versus-pleasure reactions. It's survival oriented, directing us to move toward enticing goals and away from potential threats.

LEVEL 2: HABITUAL RESPONSIVENESS. As we move through life's challenges, we develop new skills, embedding them into long-term memory. Slowly, over many years of childhood development, we build a repertoire of habitual behaviors that we use to achieve most of our goals. Usually we are unconscious of our habitual actions, but we become aware of them when they interfere with our goals.

LEVEL 3: INTENTIONAL DECISION MAKING. This level of awareness is where most of our logic, reason, and attention go to solve simple problems and accomplish day-to-day tasks. In our previous book *How God Changes Your Brain*, we referred to it as our "everyday" consciousness to distinguish it from the self-reflective awareness that leads to personal transformation. Everyday consciousness is also very limited, and when we are working on a task, we aren't very aware of much else that is happening around us. Everyday consciousness is related to our short-term working memory, which contains only enough information to make moment-to-moment decisions. These processes take place in specific areas of our frontal lobe.

Here's a simple demonstration of the limited awareness that exists on Level 3: You are probably very aware of the words you are reading right now, but not the chair you are sitting in or most of the ambient sounds in the room. However, the moment you consciously shift your attention to the chair and the sounds, you'll find that you can't continue reading. That's how everyday consciousness works, but we rarely notice how limited it actually is. In fact, when we are making decisions and moving toward specific goals, we are only barely aware of what is happening in the present moment.

LEVEL 4: CREATIVE IMAGINATION. Decision making and goal achieving is a strenuous neurological process, and the brain must take frequent breaks in order to reset its neurochemistry. Normally, this process involves the relaxation of both our body and our thought processes, and if we fail to heed the signs of fatigue, we can experience severe emotional stress.

It is essential to take hourly relaxation breaks from work. As you relax, some areas of your brain actually become more active, especially in your frontal lobe, and your mind begins to wander and daydream. Not only is your brain refreshing the neurochemicals needed to make decisions, it is actually engaged in creatively solving problems.¹⁰ It's also essential for memory formation and recall, but most important, this relaxed state of daydreaming allows you to enter the higher stages of awareness where the path towards Enlightenment often begins.

Creative imagination can also occur when a person purposefully focuses awareness on a given problem and finds a new kind of solution. This process of creative imagination may utilize the different sides of the brain to posit a problem and come up with a more holistic or artistic solution. Many scientific and mathematical discoveries are made this way.

LEVEL 5: SELF-REFLECTIVE AWARENESS. Most people unconsciously slip in and out of the relaxed mind-wandering states of Level 4, never realizing how useful they can be. But if you

purposely choose to suspend the everyday consciousness of Level 3 by relaxing into the imaginative processes of creativity, you begin to broaden your experience of the other levels of awareness. You can identify unconscious habits—good or bad—and you can begin to see the instinctual drives that motivate your brain to take action in the world. This gives you a greater ability to evaluate problems and make better decisions. When you consciously daydream and mindfully reflect on all the seemingly chaotic thoughts and feelings that float in and out of consciousness, brain scans show increased activity in the left prefrontal cortex (where your sense of clarity and optimism resides) and decreased activity in the right prefrontal cortex (which tends to generate and process worries, fears, and doubts about future actions).¹¹

In fact, most forms of negative thinking interrupt the brain's ability to perform well on every level of the Spectrum of Human Awareness. Self-reflective awareness—often called mindfulness—is one of the few documented strategies that will make you aware of your different levels of consciousness. As our brain-scan studies have shown, conscious engagement of Level 5 causes substantial increases of activity in the anterior cingulate cortex and insula, areas that help regulate emotions while increasing the brain's ability to empathetically connect with others. You are turning on more awareness centers of the brain than you typically use when you are operating in the lower levels of the Spectrum of Human Awareness, literally expanding consciousness.

The simple act of watching your own consciousness actually improves your mood, your self-esteem, and your overall satisfaction with life. Research also shows that self-reflective observation and awareness activates structures in the brain directly associated with Enlightenment and transformation.¹²

As you observe your creative mind, you will become aware that “you” are not your thoughts. This for many people is a profound insight and is directly related to the Zen Buddhist concept of Enlightenment. Negative feelings lose their power as a sense of inner serenity engulfs you, and while this happens, you turn on thousands of stress-reducing and immune-enhancing genes.¹³ You are neurologically transforming the structure and functioning of your brain, and this is what allows you to enter the highest level of our Spectrum of Human Awareness.

LEVEL 6: TRANSFORMATIONAL AWARENESS. Here we radically diverge from the previous levels and the research supporting them, and for good reason: How can you *document* that you've actually been Enlightened, and that it's not just another fantasy generated by your imagination? It's a difficult task, which is why we recommend that you keep an open mind when experiencing moments of profound, life-changing insight. However, several research teams have been able to identify those periods of exceptional thinking, where one's perspective suddenly changes and worries and anxieties miraculously melt away.¹⁴ They involve many of the same brain areas we've identified in our studies,¹⁵ and this is why we believe that transformational awareness is a *subjectively and neurologically* real experience that causes people to achieve Enlightenment. These individuals consistently report more happiness and satisfaction, and the neurological changes we see suggest that Levels 5 and 6 can even slow down the aging processes in the brain.¹⁶

The moment a person first experiences transformational awareness, he or she might feel that Enlightenment has occurred. It can last for seconds, minutes, hours, or even days. But at some point, the brain will return to its habitual way of functioning and decision making. However, it is not the same brain! Our previous studies document subtle and permanent changes will have taken place in key brain areas. Thus the everyday consciousness we return to is not the same consciousness we had before. We've changed. We have new knowledge about ourselves and the world and we have increased our ability to become more fully satisfied with our life.

The Spectrum of Human Awareness tells us that we can take specific steps to consciously improve

our lives, and it shows us what we need to do if we want to actively pursue Enlightenment. As psychologists at Drexel University emphasize, you can prepare your mind ahead of time to encourage brain-changing activity associated with sudden insights.¹⁷ It will make it easier for you to reach Level 6, which opens the door to the incredible personal transformation of Enlightenment.

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