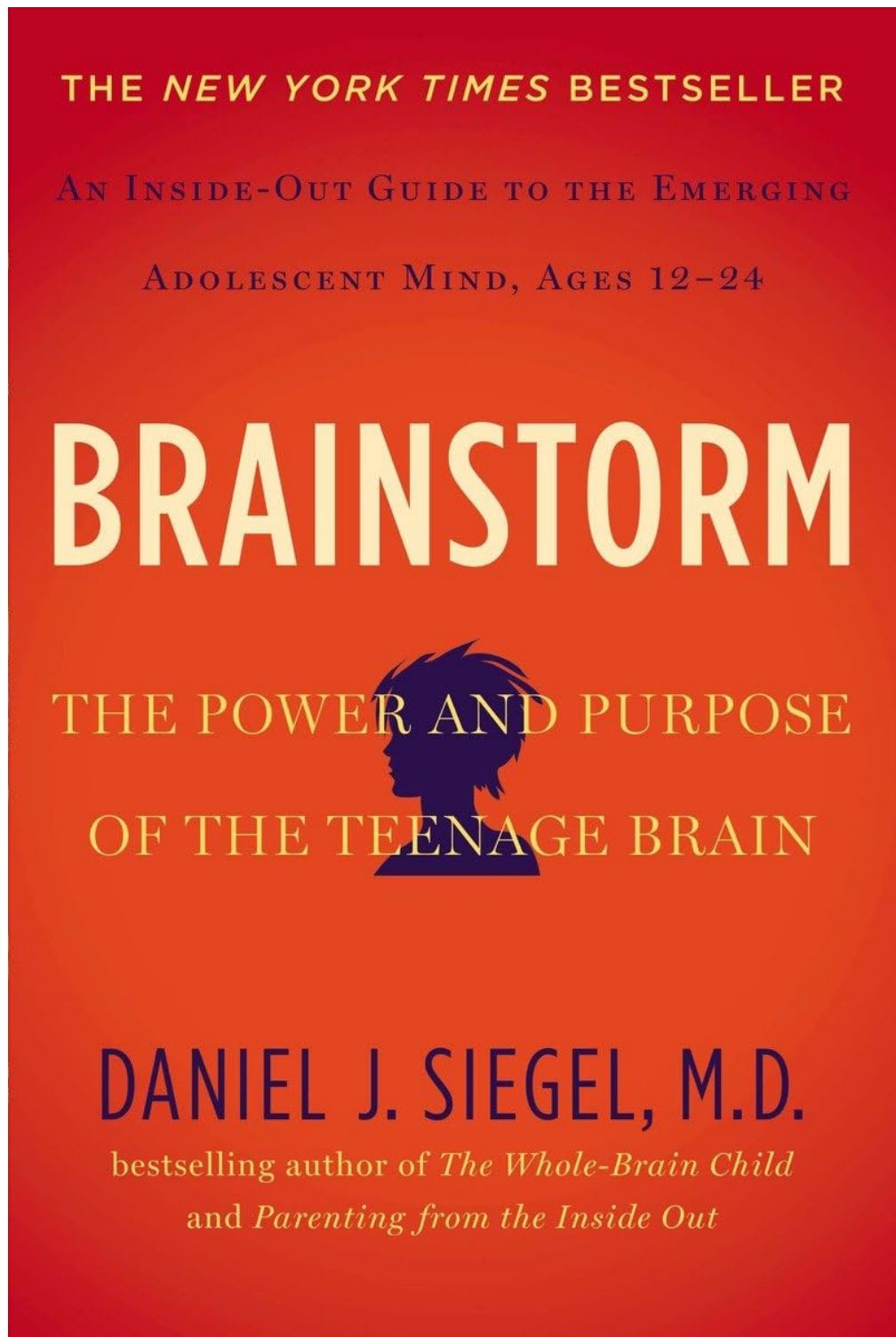


Brainstorm: The Power And Purpose Of The Teenage Brain (2013) - Daniel J. Siegel, M.D.



About Dan Siegel

Daniel J. Siegel, M.D., is clinical professor of psychiatry at the UCLA School of Medicine, co-director of the UCLA Mindful Awareness Research Center, and executive director of the Mindsight Institute. A graduate of Harvard Medical School, he is coauthor of two classic parenting books: *Parenting from the Inside*

Out (with Mary Hartzell) and *The Whole-Brain Child* (with Tina Payne Bryson). Also the author of *Mindsight* and the internationally acclaimed professional texts *The Mindful Brain* and *The Developing Mind*, Dr. Siegel gives keynote addresses at conferences and conducts workshops around the world. The proud father of two children in their twenties, he lives in Los Angeles with his wife.

Blurb

Between the ages of twelve and twenty-four, the brain changes in important and, at times, challenging ways. In *Brainstorm*, Daniel Siegel, the renowned psychiatrist and bestselling author of *Parenting from the Inside Out*, *The Whole-Brain Child*, and *Mindsight*, busts a number of commonly held myths about adolescence—for example, that it is merely a stage of "immaturity" filled with often "crazy" behavior—to reveal how it is in fact a vital time in our lives in terms of charting the course for the adults we ultimately become. According to Siegel, during adolescence we learn important skills, such as how to leave home and enter the larger world, how to connect deeply with others, and how to safely experiment and take risks, thereby creating strategies for dealing with the world's increasingly complex problems. Siegel presents readers with an inside-out approach to focusing on how brain development affects our behavior and relationships. Drawing on important new research in the field of interpersonal neurobiology, he explores exciting ways in which understanding how the brain functions can improve the lives of adolescents, making their relationships more fulfilling and less lonely and distressing on both sides of the generational divide. In this groundbreaking book, Siegel offers teens and parents a road map for understanding the adolescent mind that will help families not just survive but also thrive through the "teenage years" and beyond.

[What follows are quotes from the book above. These quotes stood out to psychotherapist Emil Barna in his 2024 reading of the book. They are not meant to be exhaustive nor representative of the entire book. All quotes are to be read in this context and must not replace medical and/or other professional advice. Note: Any typographical errors occurred through the transcription process and do not reflect what may be found in the book.]

Part I: The Essence of Adolescence

"One of the most powerful myths surrounding adolescence is that raging hormones cause teenagers to "go mad" or "lose their minds." That's simply false. **Hormones do increase during this period, but it is not the hormones that determine what goes on in adolescence. We now know that what adolescents experience is primarily the result of changes in the development of the brain.** Knowing about these changes can help life flow

more smoothly for you as an adolescent or for you as an adult with adolescents in your world."

"the "work" of adolescence [includes] the testing of boundaries, the passion to explore what is unknown and exciting can set the stage for the development of core character traits that will enable adolescents to go on to lead great lives of adventure and purpose."

"The healthy move to adulthood is toward interdependence, not complete "do-it-yourself" isolation."

"Studies show that **when teachers were told that certain students had "limited intelligence," these students performed worse than other students whose teachers were not similarly informed.** But when teachers were informed that these same students had exceptional abilities, the students showed marked improvement in their test scores. Adolescents who are absorbing negative messages about who they are and what is expected of them may sink to that level instead of realizing their true potential. As Johann Wolfgang von Goethe wrote, **"Treat people as if they were what they ought to be and you help them become what they are capable of being."**

"From around age twelve to age twenty-four, there is a burst of growth and maturation taking place as never before in our lives. [...] the adolescent period of life is in reality the one with the most power for courage and creativity."

"Brain changes during the early teen years set up four qualities of our minds during adolescence: novelty seeking, social engagement, increased emotional intensity, and creative exploration. [...] These changes affect how teens seek rewards in trying new things, connect with their peers in different ways, feel more intense emotions, and push back on the existing ways of doing things to create new ways of being in the world."

1. **Novelty seeking** emerges from an increased drive for rewards in the circuits of the adolescent brain that creates the inner motivation to try something new and feel life more fully, creating more engagement in life. **Downside:** Sensation seeking and risk taking that overemphasize the thrill and downplay the risk result in dangerous behaviors and injury. Impulsivity can turn an idea into an action without a pause to reflect on the consequences. **Upside:** Being open to change and living passionately emerge, as the exploration of novelty is honed into a fascination for life and a drive to design new ways of doing things and living with a sense of adventure.
2. **Social engagement** enhances peer connectedness and creates new friendships. **Downside:** Teens isolated from adults and surrounded only by other teens have increased-risk behavior, and the total rejection of adults and adult knowledge and reasoning increases those

risks. **Upside:** The drive for social connection leads to the creation of supportive relationships that are the research-proven best predictors of well-being, longevity, and happiness throughout the life span.

3. **Increased emotional intensity** gives an enhanced vitality to life.

Downside: Intense emotion may rule the day, leading to impulsivity, moodiness, and extreme, sometimes unhelpful, reactivity. **Upside:** Life lived with emotional intensity can be filled with energy and a sense of vital drive that give an exuberance and zest for being alive on the planet.

4. **Creative exploration** with an expanded sense of consciousness. An adolescent's new conceptual thinking and abstract reasoning allow questioning of the status quo, approaching problems with "out of the box" strategies, the creation of new ideas, and the emergence of innovation. **Downside:** Searching for the meaning of life during the teen years can lead to a crisis of identity, vulnerability to peer pressure, and a lack of direction and purpose. **Upside:** If the mind can hold on to thinking and imagining and perceiving the world in new ways within consciousness, of creatively exploring the spectrum of experiences that are possible, the sense of being in a rut that can sometimes pervade adult life can be minimized and instead an experience of the "ordinary being extraordinary" can be cultivated. Not a bad strategy for living a full life!

"When adults stop using their potential for creative exploration, the way they reason and approach life's problems becomes simply a repeated familiar routine and imagination goes out the window."

when adults lose the four distinguishing features of adolescence, when they stop cultivating the power of novelty seeking, social engagement, emotional intensity, and creative exploration, life can become boring, isolating, dull, and routinized.

"the four features of adolescence are exactly what we need to not only live a vital life as teens, but also to keep our brains growing throughout our lives."

ES: Emotional Spark—honoring these important internal sensations that are more intense during adolescence but serve to create meaning and vitality throughout our lives.

SE: Social Engagement—the important connections we have with others that support our journeys through life with meaningful, mutually rewarding relationships.

N: Novelty—how we seek out and create new experiences that engage us fully, stimulating our senses, emotions, thinking, and bodies in new and challenging ways.

CE: Creative Explorations—the conceptual thinking, abstract reasoning, and expanded consciousness that create a gateway to seeing the world through

new lenses.

"All the drive for new things in an adolescent's life can make an adult's daily routines seem dull. And the creative explorations that drive a teen into all sorts of new ways of thinking and behaving can make the humdrum and predictability of adult life at times seem too controlled and too limiting."

"During childhood, parents are often seen as the be-all and end-all of role models. In fact, adolescence is a time when we begin to see our parents as actual people, not heroes, who have their own flaws and limitations. Perhaps seeing parents in this way helps us leave them and go out into the world. As Mark Twain once said, **"When I was a boy of fourteen, my father was so ignorant I could hardly stand to have the old man around. But when I got to be twenty-one, I was astonished at how much the old man had learned in seven years."**

"The key is for the adolescent and the adult-who-once-was-an-adolescent to recognize these important brain changes and learn to navigate these years constructively and collaboratively in order to keep communication open between them, to optimize life for everyone, and to avoid tragic endings of risky behaviors."

"when we understand the brain, we can harness its powerful drives to make positive choices and constructive changes in our lives."

"While most measurable aspects of our lives are improving during adolescence, such as physical strength, immune function, resistance to heat and cold, and the speed and agility of how we respond, **we are three times more likely to suffer serious injury or death during this time** than we were in childhood or than we will be in adulthood. [...] With accidents, drug use, wounding from weapons, suicide, and murder, the period from twelve to twenty-four is the most dangerous time of our lives. [...] For males especially, who seem to biologically need to court danger, in some fashion to "come of age" as young men, to test limits and face risk to prove they can come out alive [...] When an adolescent gazelle runs up close to a cheetah to inspect its potential predator, it is risking its own life, not the life of its fellow gazelles"

*The push against traditional ways of doing things and of thinking about reality can yield ways of **thinking outside the box that enable new and creative ways of doing things to emerge.***

On puberty...

*With puberty, our sexual organs develop and create changes in hormone levels and in our secondary sexual characteristics, such as breasts in girls and facial hair in boys. [...] Puberty and sexual maturation often mark the onset of adolescence. [...] **A hundred years ago, the time between the onset of***

adolescence and the taking on of adult responsibilities of working and having and raising children was very short, a couple of years. In those days, puberty in girls happened around age fifteen or sixteen, and just a few years later teens would create a new family home. What has changed is that now there is a longer duration between puberty and the "end of adolescence," a transition that has no clear end point. [...] With the onset of puberty now at a younger age than ever before—in girls, often before the teen years—and the later timing of setting up a home and assuming other adult responsibilities, adolescence is now quite extended. For both adolescent and adult, keeping the lines of communication open is the most basic principle of navigating these years well.

"We are meant to live in a community, meant to live in connection with others. So if the pushing away from adults leads a teen to become isolated even from his or her peer group, then that total disconnection can be quite disorienting. [...] **Predators will be intimidated by a large group, and you can lose yourself in the group mass. That is one reason why for many but not all teens, fitting in can feel so important**—it's an evolutionary holdover of life or death."

"In modern culture, our rites of passage are often missing or minimized in importance. We seem to have lost many of our communal and sanctioned ways of taking risks and acknowledging the transition from childhood to adulthood."

"when the only close adult is your parent, the natural way to go in adolescence is entirely toward other adolescents."

Mindsight Tools #1: Seeing and Shaping the Sea Inside

***Mindsight** is the ability to truly "see" or know the mind.*

"Mindsight includes three fundamental skills. [...] The first is **insight**, the ability to sense your own inner mental life. Insight lets you know who you are now, who you've been in the past, and who you'd like to be in the near future. Insight connects past, present, and future [...] The second aspect of mindsight is **empathy**, or the ability to sense the inner mental life of another person. Empathy enables us to "see" from the other person's perspective, and to imagine what it's like to walk in their mental shoes. [...] The third component of mindsight is **integration**, the ability to link different parts of something into an interconnected whole. Integration enables us to make our relationships rewarding as we honor differences and promote compassionate connections in how we communicate. [...] Integration is the basis for living a healthy life, and so the skill of mindsight with its insight, empathy, and integration enables us to create health in our bodies, our relationships, and our minds."

"The highest region of the brain, **the cortex, makes "maps" or patterns of firing neurons**—the basic cells of the nervous system—that create an image

or representation of various things. The back of the cortex, makes maps of what we see, and the side areas, make maps of what we hear. In the frontal area we make many kinds of maps, including a map of past events and a map of possible future experiences. The most forward part of this frontal area, the prefrontal cortex, makes a map of the mind itself. This is how we sense and imagine another person's feelings, thoughts, and memories, among the many aspects of our mental life."

"When we pay attention to our inner mental life, we grow those important fibers that help us understand ourselves and others."

"This rich inner world includes your feelings, thoughts, perceptions, memories, images, and sensations, as well as your intentions, attitudes, beliefs, hopes, dreams, and desires. Even though that's a long list of inner mental processes, you can imagine that there are even more things in our inner mental sea that we can be aware of, like motivations and longings and impulses."

*Mental activities like feelings and thoughts can be described as patterns of energy and information that flow inside us. Energy comes in many forms, like light that enables us to see these words or the sound energy that we use to hear them. In the brain, ions flowing in and out of the membranes of its basic cells, the neurons, lead to the release of chemicals that allow these neurons to communicate with one another. That's electrochemical energy. **At its most basic level, whatever its form, energy is the capacity to do stuff.***

MINDSIGHT PRACTICE A: Insight and SIFTing the Mind

*Right now, try closing your eyes and simply ask yourself, what am I **sensing** right now in my body? You may feel tension in your muscles or you may sense your heart beating, your lungs breathing, or simply a wash of sensations from the body as a whole. What **images** come up in my mind's eye? Images may take many forms, including the familiar visual ones. But you can also have images of sounds and touch, an image of a time of your life or some hope for the future. Images may be hard to put into words, but don't worry about that—simply being aware of these inner mental experiences is what matters now. And what **feelings** are inside me? Emotions can involve bodily sensations, yes, but they also link our bodies to our thoughts, to our memories, and to our perceptions. Becoming aware of your emotional feelings can fill you with a wash of energy that may be challenging to name, which is fine. Just becoming aware of your emotional state is a great starting place. And now, what **thoughts** are streaming through my consciousness? It's funny, but no one really knows exactly what a thought or thinking really is! So don't worry if it's hard to define what you mean when you say you are thinking this or that. Some experience an inner voice that they can hear, others just a sense that has no words. It is fine however thoughts emerge; you just need to let yourself be aware of whatever comes up for you right now. This is the basic way we can SIFT our sea inside to*

see what is going on. When we SIFT through our minds, we check inwardly on the sensations, images, feelings, and thoughts going on inside ourselves at any given moment.

MINDSIGHT PRACTICE C: Empathy

Focusing on non-verbal signals can give us a feeling inside that may be difficult to describe with words, but it is an important way of turning on our mindsight circuits. A fun practice is to try turning off the sound on a television show or film and seeing if you can soak in the feelings being conveyed by the non-verbal signals on the screen. Try a foreign film in a language you don't understand, without subtitles, and leave the sound on so you can also take in the tone of voice of the characters in the story. Just let your mind SIFT the imagined world of the character, exploring in your own mindsight mapmaking view what the sensations, images, feelings, and thoughts might be of the characters in each scene. Don't worry about how accurate you are. Just inviting yourself to imagine the mind of another person activates those prefrontal regions in your brain that will become strengthened by such a perspective-taking practice as you try to see through the mental lens of another person.

"People who use their minds to reflect on the inner nature of their mental lives grow circuits in the brain that link widely separated areas to one another. This linkage, called "neural integration," creates the coordination and balance of the nervous system. Another term that some researchers often use for this is "self-regulation." In the nervous system, regulation is created through neural integration. And not only can people who develop the skill of mindsight promote self-understanding and empathy, they create integration and regulation within themselves, within their relationships, and within others."

MINDSIGHT PRACTICE E: Name It to Tame It

*Repair of disintegrated low-road states starts with the self-reflection of mindsight. What was the trigger? What is the meaning of that hot button issue for you? What were the signs that let you know something was being triggered in you? Once down the low road, did you take a break and if possible leave the scene? Could you feel your way to lowering your nervous system's chaotic flooding or rigid shutting down? Drinking a glass of water, stretching, getting some fresh air, moving around the room are all ways of changing your present state of agitation or withdrawal. Of course if you are the recipient of such low-road states, in that moment there may be little you can do except to remove yourself from a situation. Out of the heat of the moment, it may be extremely useful to name this process "low road" or "flipping out." These are reactive states, far from the receptive state we need to truly connect with others. And so, even stating that "I am reactive now, I need a short break" is better than simply exploding. **In the brain, naming an emotion can help calm it. Here is where finding words to label an internal experience becomes really***

helpful. We can call this "Name it to tame it." And sometimes these low-road states can go beyond being unpleasant and confusing—they can even make life feel terrifying. If that is going on, talk about it. Sharing your experience with others can often make even terrifying moments understood and not traumatizing. Your inner sea and your interpersonal relationships will all benefit from naming what is going on and bringing more integration into your life.

"When the memory of some chaotic or rigid time is in the front of your mind, try placing one hand on your chest-over your heart region—and one over your abdomen. Place a small amount of pressure from each hand and see how you feel. Now try moving the hand on your chest to the belly, and the other hand now up to your chest. Apply some gentle pressure and simply notice how you feel. Now place your hands in the positions that felt the best. What do you notice? Did you feel a calming sensation? Could you tell the difference between left on top or right on top?"

"the prefrontal region is activated to balance the brakes and accelerator of our bodies—the parasympathetic and sympathetic branches of the autonomic nervous system—and then soothes the heart and creates the state of calm in our minds"

Part II: Your Brain

"During adolescence there is an increase in the activity of the neural circuits utilizing dopamine, a neurotransmitter central in creating our drive for reward. Starting in early adolescence and peaking midway through, **this enhanced dopamine release causes adolescents to gravitate toward thrilling experiences and exhilarating sensations. Research even suggests that the baseline level of dopamine is lower—but its release in response to experience is higher—which can explain why teens may report a feeling of being "bored" unless they are engaging in some stimulating and novel activities. This enhanced natural dopamine release can give adolescents a powerful sense of being alive when they are engaged in life."**

"impulses can be put on hold if certain fibers in the higher part of the brain work to create a mental space between impulse and action. It is during the time of adolescence that these regulatory fibers begin to grow to counteract the revved-up

"go" of the dopamine reward system. The result is a decrease in impulsivity. This is sometimes called "**cognitive control**" and is one important source of diminished danger and reduced risks as adolescents develop. [...] As teens not only are we more likely to experiment with new experiences, we are also more **prone to respond with a robust dopamine release that for some can become part of an addictive cycle.** A drug, alcohol for example, can lead to release of dopamine, and we may feel compelled to ingest beer or wine of hard

liquor. When the alcohol wears off, our dopamine plummets.

We then are driven to use more of the substance that spiked our dopamine circuits. **Studies reveal that foods with a high glycemic index—those, like processed foods or even the simple carbohydrates of potatoes or bread, that lead to a rapid rise in blood sugar—can also lead to rapid rises in our dopamine levels and activity in the reward circuits of the brain. [...]**

hyperationality [is when] we think in literal, concrete terms. **We examine just the facts of a situation and don't see the big picture**; we miss the setting or context in which those facts occur. With such literal thinking, as adolescents we can place more weight on the calculated benefits of an action than on the potential risks of that action. Studies reveal that as teens we are often fully aware of risks, and even at times overestimate the chance of something bad happening; we simply put more weight on the exciting potential benefits of our actions. [And once] our teen years unfold, we move from the literal thinking of hyperrationality to the broader considerations called "**gist thinking**." With gist thinking, we consider the larger context of a decision and use intuition to aim for positive values we care about rather than focusing primarily on the immediate dopamine-driven reward."

"Paradoxically, **intuition** plays a very important role in making good decisions. This is because our intuitions, or gut feelings and heartfelt sensations, tend to focus on positive values, like the benefit of staying in school or driving at the speed limit or keeping fit. **Many teens can be too rational, and need to incorporate the non-rational input of their intuitive gut feelings and heartfelt sensations, feelings that enable them to focus on positive values versus mythical rewards that, in reality, are often just out of reach.**"

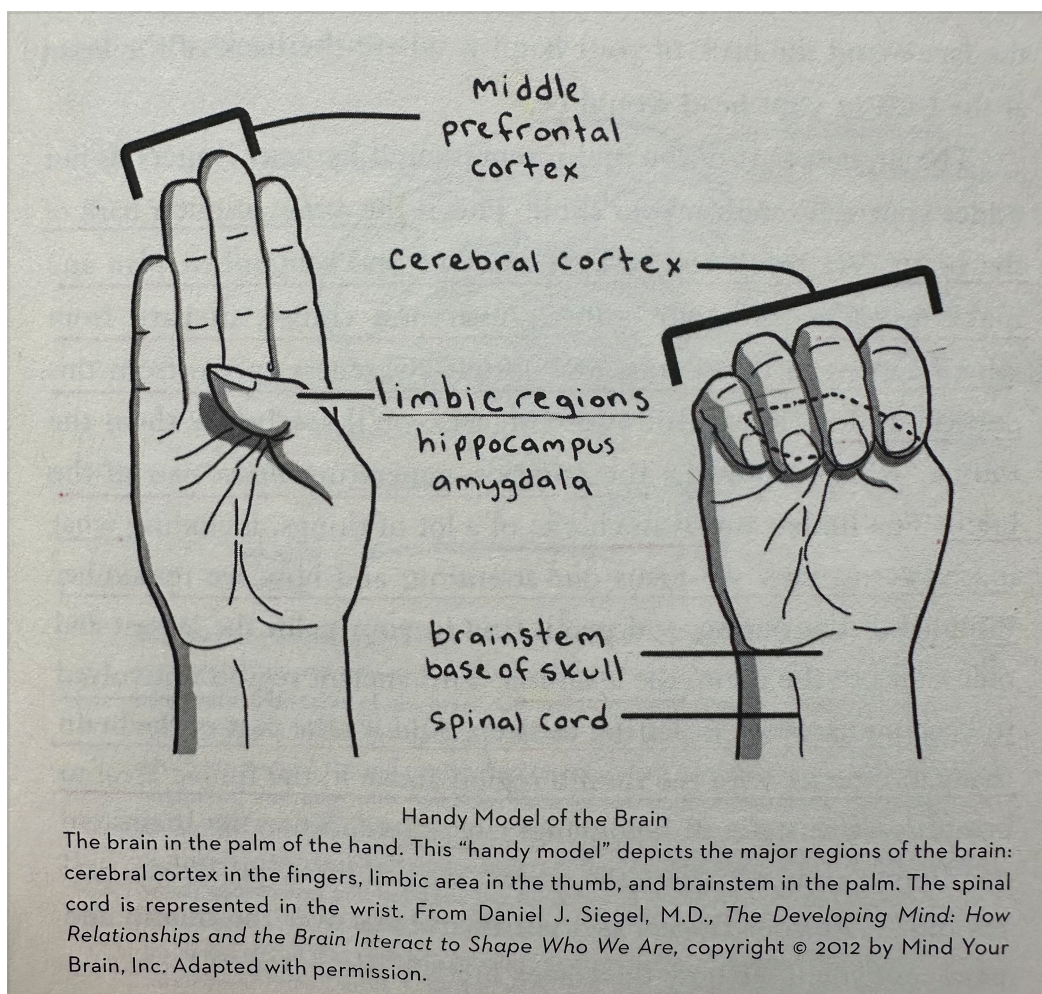
Adolescence is not a stage to simply get over, it is a stage of life to cultivate well.

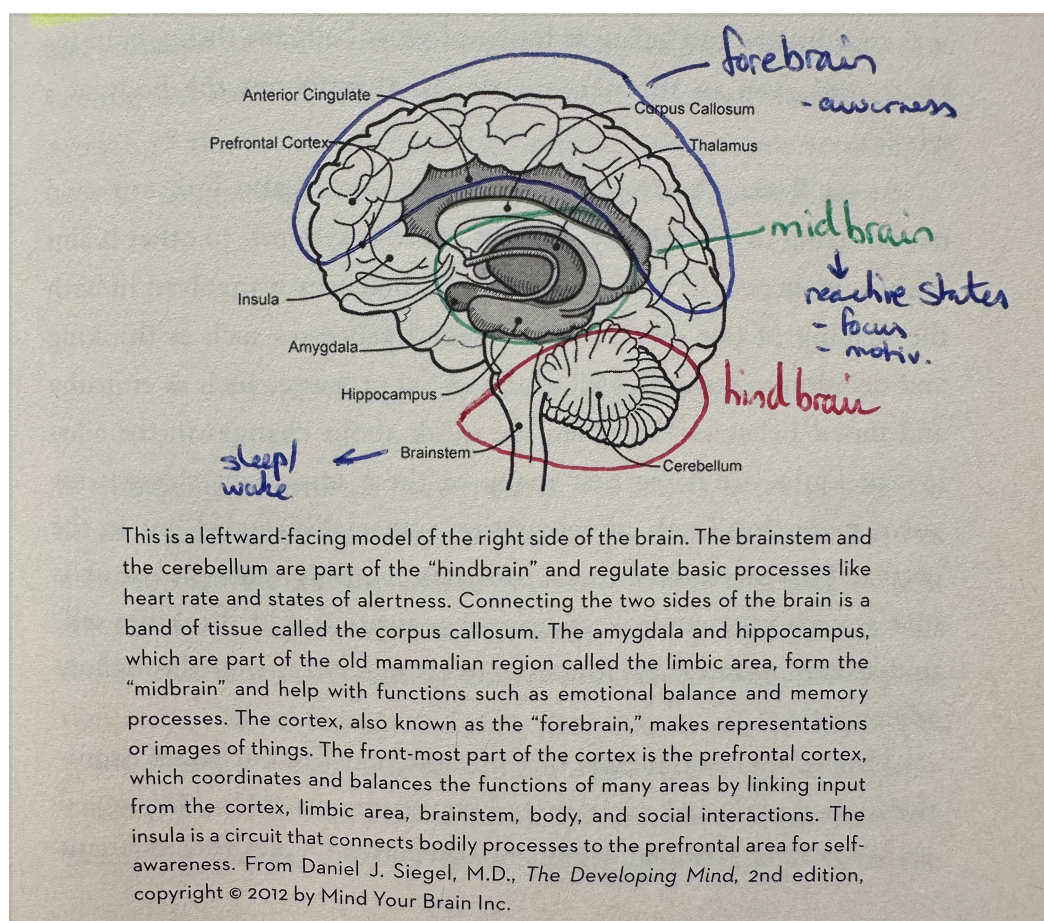
"for us as social mammals is that if older adolescents did not leave home and move away from local family members, our species would have too much chance of inbreeding and our genetics would suffer."

"Throughout adolescence, different areas of the brain link together, a process we've discussed called "**integration**." One outcome of integration is the growth of fibers of cognitive control that ultimately decrease impulsivity. As a result, adolescents are afforded more and more space in the mind to pause and consider other options of response than an initial impulse. Another outcome of this integrative growth is **sharpened gist thinking**, whereby the adolescent is able to rely more and more on intuition to see the larger picture of a situation and therefore make wiser decisions. [...] Gist thinking emerges with both experience and programmed brain development. [...] **studies suggest that gist thinking emerges from the growth of integration in our brains as teens.**"

"The brain changes during this period in two dimensions. One is how it *reduces* the number of the brain's basic cells, the neurons, and their connections, the

synapses. This decreasing of neurons and synapses is called "**pruning**" and appears to be genetically controlled, shaped by experience and intensified with stress. How can we tolerate losing some neurons? During childhood there is an overproduction of neurons and their synaptic connections. The blossoming of our neuronal populations begins in utero and extends to our prepubertal period, to about eleven years of age in girls and twelve and a half in boys. Some pruning begins early as we learn and develop skills, but the removal of our overall number of neurons and their connections reaches its peak during the robust remodeling period of adolescence. In adolescence we prune those excess connections away, leaving the ones we've been using and discarding the ones we don't seem to need anymore. [...] A second way the brain transforms during this period is that it lays down "myelin," a sheath covering the membranes among interlinked neurons. This myelin sheath enables the passage of the electrical flow, the "neuronal activations" among the remaining linked neurons, to allow faster and more synchronized information to flow. When that flow is fast and coordinated, it makes for a more effective and efficient process. As we learn specific skills and acquire knowledge, we grow new connections and even new neurons. **Once we've established these new synaptic linkages, we can lay down myelin to make that circuit quicker, more coordinated, and more effective."**





*The highest part of the brain, represented by your fingers, is just under your scalp within your skull. This is the **cortex** or outer bark of the brain. We think and reflect, perceive and remember, plan and make decisions with our cortex. Awareness comes, in part, from what happens in the cortex, and so self-awareness comes from this cortical region. If you lift your fingers, you'll see below them the thumb, which represents the emotion-generating limbic area of the brain. The **limbic area** is in charge of a lot of things, including what motivates us, how we focus our attention, and how we remember things. Lift the thumb, and you'll find in your palm the lowest and oldest area of the brain, the **brainstem**. This ancient region is involved in keeping us awake or letting us sleep. And it's the part of the brain that can interact with the thumb region above it, the limbic area, to create reactive states of being angry or scared.*

"The brain itself sits atop the spinal cord, represented by your wrist. Input from this neural tube within the backbone, along with other neural inputs from the body and from the body's organs such as the heart and intestines, enables the processes of our organs, muscles, and bones to directly influence the neural firings in the skull itself, neural activity within the subcortical and cortical parts of the brain. Not represented here directly is the *cerebellum*, which would be just behind the limbic area and plays an important role in balancing the body's motions and also balancing the interaction of our thoughts and feelings. A band of neurons, called the corpus callosum, links the left and right sides of the brain to each other and coordinates and balances their activities."

"A network contains many different parts, or nodes, and a hub is the aspect of the network that links those different nodes to one another. A node in the nervous system, for example, might be collections of neurons in the limbic area or in the cortex. One important nervous system hub that links the nodes together is just behind the forehead. Because it is at the front of the frontal areas, it is called the prefrontal cortex. Notice how in your hand model this integrative prefrontal region, located at the ends of your fingers, your prefrontal-fingernail region, connects the cortex to the subcortical limbic-thumb and brainstem-palm regions. In addition, this prefrontal region links input from the body itself and from other people."

"Because [...] pruning and myelination restructures the brain's networks of connections, it is often called "**remodeling**." The remodeling changes in the integrative frontal areas of the cortex are responsible for the finding that as teens we begin to become aware of ourselves and to think about life in conceptual and abstract ways. Our emerging adolescent minds begin to consciously and creatively explore the deeper meanings of life, of friendships, of parents, of school, of everything."

"The growth of the frontal lobes permits us to experience our human ability of knowing about knowing of reflecting on how we think, how we feel, why we do what we do, and how we might do things differently."

"Our species name is *Homo sapiens sapiens*. *Sapiens* means "knowing." So with the double knowing we are the ones who not only know, but *know* we know. And this knowing we know emerges first in adolescence. Creative and conscious explorations of conceptual thinking and abstract reasoning enable the brain to approach old problems in new ways. **A fifteen-year-old isn't simply a ten-year-old with five additional years of experience.**"

Just as when adolescent elephants are deprived of their male elders in a herd and then run wild and become destructive without the adults' presence, total isolation of adolescent humans from the adult community can be an unhelpful standoff.

"one aspect of this remodeling is pruning, or letting go of the connections in the brain that are not needed. Pruning in general can lead to important changes in how we function as teens—and sometimes it can unmask potential problems. This is why a number of mental health challenges, like mood difficulties such as depression and bipolar disorder, or thinking difficulties such as schizophrenia, may emerge more in adolescence than in childhood. Pruning, along with hormonal changes and alterations in how genes are expressed, shapes our neural activity and synaptic growth and makes the brain's functioning change dramatically during the teenage years."

"the vulnerability of the adolescent period happens because the pruning of

childhood circuits that may have been "at risk" leads to the unmasking of those deficiencies. The new activation of genes during adolescence, which shape how neurons grow and how they interact with other neurons, may also influence the vulnerability of a teenager's brain. [...] **If stress is high, this pruning process may be even more intense, and more of the at-risk circuits may be diminished in number and effectiveness.** The result is the unmasking of underlying vulnerability during the pruning of adolescence. [...] During high school and the college years, major psychiatric disorders, such as depression, bipolar disorder, or schizophrenia, can express themselves for the first time, even in otherwise well-functioning individuals."

"During adolescence, the pruning and myelination and the remodeling that they create happen primarily in the cortical regions. While one of those areas is the prefrontal cortex, it is important to keep in mind that this most forward part of the frontal cortex is not super-special by itself; it is more accurate to say that the prefrontal region and related areas are important because they coordinate and balance other regions of the brain. In this way, we can say that the prefrontal cortex is integrative as it links differentiated areas to one another. This integration enables the "whole to be greater than the sum of its parts." With this integration we achieve more complex and useful functions."

"While **various drugs can shut off our brain's integrative functioning** in the short run and chronic drug usage can distort that coordination and balance in our lives in the long run, we can also be prone to losing integration in other ways that don't involve drug use. **Sometimes we can simply "flip our lids" and have the prefrontal integrative fibers of our brains stop coordinating our whole system.**"

"The brain functions in a state-dependent way, meaning that while it is in a calm state, certain integrative functions may work well and efficiently. But in other situations, those same functions may not work so well."

[When you "flip your lid"...]

*Now, when it comes to teenagers, this flipping one's lid is often seen as being a "crazy teenager." But let's make an agreement not to call this crazy; let's call it what it is—**remodeling and shifts in integration.** In a construction site, sometimes the previously working plumbing and electricity are temporarily disabled. We don't have to call that a faulty building—it's just a reconstruction project. Remodeling has its inevitable downsides, for sure. For a short time, or for bursts of time, those utilities on the construction site are off-line. No effective electricity, no plumbing, no workable staircase. These are all temporary shifts in what works well. The good news is that **remodeling is a process that will create new and improved ways of functioning. Remodeling is necessary to adapt the structure of our neural foundation to adjust to new needs, and remodeling in adolescence is necessary to adapt our human family to the new needs of a changing world.** [...] The*

reconstruction zone of the prefrontal cortex in particular means that many of the functions that this frontal area of the brain enables through its integrative role—balancing emotions, planning for the future, having insight and empathy—are more easily thrown off-line with intense emotions and peer influence.

"emotions can arise rapidly and intensely without the calming influences of the prefrontal cortex. The prefrontal region can send soothing circuits, called "inhibitory fibers," down to these lower areas and keep their firing calmed.

Brain scans reveal that when teens are shown a neutral face in a photograph, a major area of the limbic region, the amygdala, becomes activated, whereas in adults the same photograph merely activates the reasoning prefrontal cortex. The result for teens can be an inner sense of conviction that even another person's neutral response is filled with hostility and he cannot be trusted. A blank expression or a bump in the hallway can be interpreted as intentional, and a teen may respond with an irritated remark even if the look or bump was completely innocent. [...] **There are two routes that send information to the amygdala. One is a slow route in which the higher cortex sifts through information, reasons, reflects, and then informs the amygdala in a calm and rational way. There's a second route, one that bypasses the cortex and simply sends incoming streams of perception directly to the amygdala. This is the fast route.** Studies of adolescents reveal that even under calm conditions, the fast route to amygdala activation often occurs more readily in teens than in adults; the slow route is used more in adults."

MINDSIGHT TOOLS #2: Time-In

"If you are interested in developing integration in your own brain, **taking time-in to focus your attention on your internal world has been shown in research to grow those important prefrontal fibers that integrate your life.**"

""**Time-in**" is a term I use to describe the time we can take be it a minute a day, ten minutes a day, or throughout the day—to intentionally **focus our attention on the inner world of our mental, subjective experience.**"

"research has shown that **the more present we are in life, the higher the level of the enzyme telomerase** in our bodies, which maintains and repairs the life-preserving ends of our chromosomes, called telomere caps. With the day-to-day stresses of life and the natural progression of the aging process, these chromosome caps are slowly whittled down. **Building up more telomerase can help us be healthier and live longer.**"

"How you focus your attention drives energy and information flow through your nervous system. **Where attention goes, neural firing in the brain occurs. Where neural firing happens, neural connections are strengthened.** Attention is the way we activate specific circuits in the brain and strengthen them. And when you strengthen neural connections that are linking

differentiated areas of the brain to one another, you are creating integration in the brain."

"researchers suggest that the key to long-term benefits is regular, daily [breath-awareness] practice. Some have said that for adults a **minimum of twelve minutes** seems to be important each day. But it's **better to do a couple of minutes each day if those daily dozen are not possible**. Just as with aerobic exercise, while thirty to forty-five minutes a day is ideal on a regular basis, if you don't have that time, it is **better to do something each day rather than nothing**."

"One challenging aspect of this experience is that we are so used to focusing on the outside world of stimulating sounds and sights that focusing on the internal world of sensations can be less captivating. In short, **you may get bored!**"

Breath-awareness practice

With your eyes open, let your attention focus on the middle of the room. Now send your attention to the far wall or ceiling. Now direct your visual attention to the middle of the room again. And now bring your attention to about book reading distance, as if you have a book or magazine in your hands. Notice how you can direct the focus of attention [...] let the sensation of the breath be the object of attention. Let's begin at the level of the nostrils with the subtle sensation of the air coming in and going out. Ride the wave of the breath, in and out, and just sense that sensation. Now notice how you can direct attention from the nostrils to the chest. Let the sensation of the chest rising and falling fill awareness. Up and down, simply ride the wave of the breath in and out. Now redirect attention to the abdomen [...] place a hand on the belly and simply notice how the abdomen moves out when air fills the lungs, and the abdomen moves in when air escapes the lungs [...] ride the wave of the breath by focusing attention on the sensation of the abdomen moving out and moving in. [...] let awareness become filled with the sensation of the breath wherever it feels most natural. It may be the abdomen moving in and out, the chest rising and falling, or the air at the nostrils. Or it may simply be the whole body breathing. Just let the sensation of the breath fill awareness wherever you feel it most readily. [...] ride the wave of the breath, in and out [...] The mind is like the ocean. And deep beneath the surface of the ocean, it is calm and clear. From this place of clarity beneath the surface, it is possible to just look up and notice whatever conditions are at the surface. It may be flat, or choppy with waves, or there may even be a full storm, but no matter the conditions, deep beneath the surface it remains calm and clear. The mind is like the ocean. And just sensing the breath brings you beneath the surface of the mind. From this deep place in the mind, it is possible to notice whatever surface activity is happening in the mind, such as feelings or thoughts, memories or ideas. From this deep place beneath the surface of the mind, it is calm and clear. And just sensing the breath brings you to this place of clarity and tranquility. [...] Just

*ride the wave of the breath, in and out. [...] let the sensation of the breath fill awareness. When something distracts attention away from the breath and you've come to notice that awareness is no longer filled with the sensation of the breath, just notice the distraction and then let it go, returning the focus of attention to the breath and filling awareness with the sensation of the breath. [...] you may find your attention goes to something other than the breath. For some, naming the distraction helps to let it go. For others, such naming is itself a distraction. [...] Find what works for you. Remember, in addition to the task of simply focusing on the breath, it is recommended that you consider regarding yourself with kindness as you go through this practice. Everyone's mind wanders at times, and that is just what it means to be human. In fact, part of the strengthening aspect of this practice comes from the redirecting of attention, which is like contracting a muscle. **The unintentional distractions are like relaxing a muscle, the refocusing on the breath is the tightening of the muscle. Focus, distraction, refocus, distraction, refocus again. That's how we work out our minds** [...] If you find yourself getting sleepy, you can always open your eyes a bit [...] if that doesn't help to energize the mind, **you can try this exercise standing up**. Same practice, only now you are vertical. Let's give this a try. After a designated period of time, when you are ready, you can take a more intentional and perhaps deeper breath and let your eyes come open, if they are shut, and we'll bring this time-in breath awareness practice to a close.*

Part III: Your Attachments

"An **attachment model** is in effect the way in which our brains remember the **attachment relationship(s)** we have had, or still have, and how we have adapted to these formative attachment experiences.

The models we carry with us in our minds are very influential in terms of how we feel, how we think, how we behave, and how we connect with friends, teachers, and later on, our romantic partners as we move through our lives. And **since we can have more than one model if we've had more than one attachment figure, then each of these brain states, these models, can influence how we behave and react in different situations."**

"Our childhood period of dependency goes on for a good 15 percent of our lifetime—a really long time in mammalian terms. And if we include the period of adolescence, now extended into the twenties, that percentage before we reach adult status in our society is higher still, approaching a third of our lives. **Human attachment can be understood as involving four S's. We need to be seen, safe, and soothed, in order to feel secure."**

"If we've had secure attachment in our earlier childhood, then we enter these early adolescent stages with a more secure model, a state of mind that is filled with many of the prefrontal functions that emerge with integration strong and well-developed. Science has shown that secure attachment is associated with

the integrative prefrontal functions that include regulating the body, attuning to others and ourselves, balancing our emotions, being flexible, soothing our fears, having insight into ourselves and empathy for others, and having a good grounding in a sense of morality. [...] If you've had a history of insecure attachment, to grow toward security happens by moving from non-integrated brain functioning to the development of integration in your brain. And that development can potentially happen at any age. **Secure attachment confers resilience as it likely stimulates the growth of integrative connections of the prefrontal cortex.**

"certain variations in our genetic makeup that influence ways we process dopamine, serotonin, or oxytocin may have a direct effect on how we respond to certain challenging experiences in life. [...] **You may not be able to alter your genes, but you can alter your mind and your behavior to change your brain.** In other words, your attachment models are changeable, and knowing about your attachment models is crucial so that you can move them toward security whatever your age."

making sense of your life is a science proven way to move from non-secure to secure models of attachment. It's a way of integrating your brain and empowering your life.

Secure attachment

"After about a three-minute separation from the caregiver, the one-year-old infant seeks contact with the caregiver during their reunion, touches base for comfort, and then readily returns to exploring a room filled with toys. [...] The idea is that the parent has provided both a safe haven and a launching pad; the child feels seen, safe, soothed, and secure with this parent."

Avoidant attachment

"one-year-old infants who were separated from their father or mother later avoiding that parent when he or she returned, rather than reconnecting and seeking comfort from the parent [...] the child's experience of not being seen or soothed over the first year of life with this parent has led to the development of a non-secure model of attachment [...] This is a learned response quite adaptive for the child's survival. [...] this doesn't mean that you can't have a secure attachment with your other parent [...] Having this avoidant model as your model for close relationships can potentially lead you to feel disconnected from others and also from your own emotions and needs. [...] the limbic area that mediates attachment still retains a deep drive for connection with others. We all need to feel close to the people around us and know that we can rely on them for comfort. That's just being human. In this respect, the self-knowledge that comes from realizing you may have been living your life following an avoidant model can be very empowering. It can allow you to search the quiet,

often hidden signals inside you that you may want closer connection with others."

Ambivalent attachment

Being seen, safe, and soothed does not happen in a reliable way. When the parent returns after a separation, you go to her, but you cling to her because you are uncertain whether she'll meet your needs for comfort. Maybe she will, but maybe she won't. Better hold on! Your ambivalent model of attachment does not allow you to become soothed as you never know what to expect [...] Since the human brain is composed of "mirror neurons" that soak up the feelings of others around us, you naturally sponge up her anxiety and fear. All you were feeling was hunger, but after interacting with your mom you now also feel fearful and anxious. Whose feelings are whose? That's the confused self created within ambivalent attachment relationships.

Disorganised attachment

"For a variety of reasons, your parent, say your mom, is terrifying to you. [...] The problem with being terrified of an attachment figure is that it activates two different circuits in your brain that just don't work together. One is the ancient brainstem circuit that mediates a survival reaction. This circuit gets you to flee or freeze in reaction to being terrified. Get away from this source of terror! But the second circuit is the limbic-based attachment system that motivates you if you are terrified to go toward your attachment figure to be protected and soothed. The problem is you cannot go both toward and away from the same person. After separation, the infant shows behaviors of attempting to both approach and withdraw from the parent, a very disorganized approach to the reconnection. So when an attachment figure is the source of terror, we become fragmented. This disorganized attachment makes us vulnerable in many ways. We can have a tough time balancing our emotions, having good relationships with others, and even thinking clearly under stress. [...] When we dissociate, we dis-associate different aspects of ourselves, such as separating feelings from memories, thoughts from actions. We can feel unreal and broken apart."

Reactive attachment

"At one extreme of our human spectrum of experiences is the complete absence of attachment, in which there is no consistent figure that we can attach to. [...] Reactive attachment can be thought of as the best a child can do with the absence of any attachment figure not a response to forms of security or insecurity. This absence and the "disorder" that emerges with it are distinct from the variety of insecure forms of attachment we are exploring here."

Research has shown clearly that no matter our challenging past, if we make sense of how our early experiences have shaped us and learn our new models of security, we can offer our children security of attachment.

Questions about attachment

Background

1. What is (was) it like growing up in your family?
2. Who is (was) in your family?
3. What is (was) your parents' philosophy about raising children?
4. What do (did) or don't (didn't) you like about being raised in your family?
5. Would you raise (Are you raising) your own children in a similar way, or differently?

Relationships

1. Do (Did) you get along well with your parents and others in your family?
2. How do (did) your family members get along with one another?
3. How have your relationships in your family changed over time?
4. If you have two parents, how are (were) your relationships with each parent similar or different?
5. State a few words that reflect your relationship with each parent from your earliest years.
6. Are there ways you have tried to be like or not like each of your parents?
7. Are there any others in your life who have served as parenting figures to whom you feel attached? If so, please answer the above questions regarding that person or those persons.

Separation

1. Can you remember your first time being separated from your parents? What was that like and how did it affect you and your parents?
2. Did you ever experience a long separation from your parents in your childhood? What was that like for you and for your parents?

Discipline

1. What ways do (did) your parents respond to your behaviors to teach you how to behave?
2. Do (Did) your parents use punishment in their discipline?
3. How have these strategies of being disciplined influenced your development?

Fear and Threat

1. Have you ever felt threatened by your parents?
2. Have you ever felt rejected by your parents?
3. Have there been any other experiences that may have been overwhelming in your life? What were these, and how do you feel they

- have influenced your life?
4. Do any of these experiences feel like they are still very much alive now in your life?

Loss

1. Has anyone significant in your life died?
2. Has anyone significant in your life left?
3. What impact have these losses had on you and your family?
4. How do these losses affect you now in your life?

Emotional Communication

1. How do (did) your parents communicate with you when you are (were) happy and excited?
2. What happens (would happen) when you are (were) distressed, unhappy, injured, or ill?
3. Does (Did) each parent respond with different patterns of connecting to you when your emotions are (were) intense?
4. How do you communicate with others now when emotions run high?

Safe Harbor

1. Are (Were) there relationships you can (could) turn to, or places you can (could) go, that you can (could) rely on to help you feel comforted at difficult times? Did such a safe harbor exist when you were a child?
2. How do you feel those sources of a safe haven affect (affected) your life?
3. Do (Did) you feel seen, safe, and soothed by your parents?

Launching Pad

1. How do (did) your parents support your explorations away from them or outside the home?
2. How are (were) your interests supported by your parents?
3. Did you feel secure as a child to go out and explore the world?

Now

1. What is your relationship like now with your parents?
2. Why do you think your parents act (acted) the way they do (did)?
3. Do you try to not do things because of how your parents treat (treated) you?
4. As you reflect on all of these experiences, how do you think they influence the ways you relate to other people?
5. How do you feel all of these things we have been exploring have influenced who you are now as a person and how you have come to be the way you are?

Future

1. What would you wish for yourself in your future relationships?
2. How do you imagine the experiences from your attachment relationships and early childhood may shape the person you can become?
3. Are there any factors from your past that are restricting you in the present and limiting who you can be in the future?
4. What do you see as your "growth edge" for things you'd like to change in yourself so that you can become freed up to be the person you would like to be in the future?
5. Any other questions we should have covered or that you may have now?

*Research reveals that **the more coherent a narrative we have of our own attachment issues in childhood**, the more we've made sense of how our early life experiences have shaped us, **the more likely our children will have a secure attachment to us and the more rewarding in general our interpersonal relationships will be.***

The benefits of having a good understanding of your life story.

***Even when experiences may have been difficult, or even frightening, a secure narrative reveals this quality of the person being present for whatever comes up in the interview.** [...] The hallmark of these avoidant narrative reflections is that the individuals insist that they do not recall anything about family life and that their family life did not influence how they developed. That is a form of incoherence in that **if you don't remember something, how do you know that this something did not affect you?** The adults with this narrative are said to have a "dismissing" state of mind—they dismiss the idea that their past relationships may have had an impact on who they are. [...] there is an underdevelopment of the right hemisphere of the brain in individuals with avoidant attachment. It is the right side that stores autobiographical memory and holds our raw emotional needs and feelings. In this way, the avoidant model enables us to not feel our needs, and we also don't recall our lived experiences of family life. [...] Personal reflection in the cortex is a process that draws on autobiographical mappings in the brain's cortical region, dominant on the right side of the brain. Such autobiographical reflection is the way we look inward to the meanings and events of our lived experience. Interestingly, **even our gut reactions and heartfelt sensations, signals arising from the intestines and the neural circuitry around the heart, arise and end up primarily on the right side of the brain, as it is the right prefrontal cortex that receives such bodily input.** These sources of knowing are generally not experienced much by individuals with avoidant attachment. [...] The left side of the cortex is dominant for language, logic, linear and literal thinking, and even making lists, like this one! [...] facts are dominant on the left side, while our autobiographical recollections of episodes of experience are right-side dominant. [...] the right side is often considered "more emotional" in that subcortical and bodily input shape our emotional life more directly and perhaps more spontaneously and*

robustly. The right side of the cortex maps out the whole of the interior of the body; but the left does not do this. This means that **intuition, how we receive the wisdom of the body's input from our muscles, our hearts, our intestines, likely first influences our right cortex.** The left side of the cortex has emotion, too, but it may be experienced in a different way, as that side is not so powerfully influenced by the subcortical regions as the right is. [...] The left side of the brain has one frontal region that when activated creates an "approach state" that empowers us to go out in the world and face challenges. In contrast, the right side has areas that create a withdrawal response to new things. This approach to the world goes along with what some summarize in this general way: **The left looks outward to the world, while the right looks inward, in the self and others.**

Resolving grief and trauma...

unresolved trauma or loss can be resolved through integrating the processes of memory and narrative, and the person can move from non-secure to secure models of attachment. In terms of the left and right brain, **disorganization may occur when the flood of bodily sensation and autobiographical memories of the right are not easily taken in and sorted through by the linear left trying to tell its story with words.** So at a minimum, disorganization and the unresolved loss or trauma it reveals can be seen as an impaired coordination of the two hemispheres. With reflection, we can transform raw implicit memories into explicit memories of facts in the left and autobiographical memory in the right so that they do not enter our minds in various forms of intrusive emotions or memories and instead become part of a coherent narrative of who we are.

"teachers of kids with avoidant attachment—who didn't even know the child's attachment history—treated them as if they didn't need help even when they did. [...] For many with avoidant attachment, there seems to be difficulty expressing inner needs, or of reaching out to depend on others to meet those needs."

"parents often do what they do because of how they've adapted to their own childhood experiences. Finding ways to connect more fully can happen, but it just takes time, understanding, patience, and intention. This non-secure model of attachment that helped the individual survive is one of being disconnected from others. So if this is your relationship, please don't measure this as a lack of love. It is really a lack of skills to connect. And in many ways, it is a survival mechanism from the past to disconnect from the need for closeness that simply needs to be updated now in the present."

Here are some basic practices if you've had a history of avoidant attachment:

1. **Practice becoming aware of your internal bodily states.** [...] If

focusing attention on both limbs at the same time is difficult, try to first focus on the right side and then on the left.

2. **Become aware of non-verbal signals.** *Try watching television shows with the sound off or foreign language films without subtitles in a language you don't understand. These experiences will enable you to let your left-sided language centers take a break and your right-sided non-verbal signal perceiving circuits become more active. Recall that **these signals include eye contact, facial expressions, tone of voice, gestures, posture, and the timing and intensity of responses.***
3. **Learn to use non-verbal expressions.** *Try looking in a mirror or taking a video of yourself and watching the recording. Try to exaggerate the sending of these important right-sided signals.*
4. **Autobiographical memory is also a specialty of the right side of the brain.** *Begin by simply writing down the details of what you did today. Start with the specifics of how you got out of bed, what you did with your body as you got dressed, how you ate your breakfast. See if you can sense those experiences as you are recalling them. After these recent memories have been recounted, try more distant autobiographical reflections, also with details. Don't worry if you can't recall childhood experiences, as these may be quite difficult to access, and some may not have been encoded into your memory as well.*
5. **Emotions are felt on both sides of the brain, but they may be more direct or spontaneous on the right.** *When you are ready, you can find a friend who can partner with you in sending and receiving non-verbal expressions of differing emotions. Try out these basic nine: **joy, excitement, surprise, sadness, fear, anger, disgust, guilt, and shame.** See also if you can simply notice the emotions as they rise up, even fleetingly. Let the sensation of emotion fill you, and don't try to analyze it or even name it. [...] An exercise you can perform is simply to **say a neutral sentence with differing contexts embedded in the tone of your voice and the timing of the words.** Here are two of an infinite variety of sentences you can try using this technique: "I expected you to come to my party on time," or "You always do what you say you will do." Try emphasizing each word in turn with different tones of voice, and see if you can sense how this changes the meaning of the message.*
6. Recall that **studies have shown that even if there is an outer focus on independence, there is often an inner sense of needing closeness that is beneath awareness.** *With this in mind, consider trying to tune in to any inner hints, however subtle, that you may feel a desire to be closer to people in your life. Being aware that avoidance was an important adaptation for you, go slow. Reaching out to another person to express your feelings in a gesture of wanting more time to*

connect can be an important starting place. Since we each participate in creating our relational worlds, you can have a say in how to form new kinds of relationships in your life now.

"ambivalence can be like living in an emotional fog if not at times an outright storm. [...] **your parents likely were doing the best they could**, and that this way of being is most helpfully seen as their adaptations to challenges in their own childhood relationships or to other aspects of their lives. The leftover issues of their own parents (your grandparents) may have flooded their ability to be present and open in a clear and receptive way to what was happening within you. [...] In many ways, **children can become an unintended receptacle for their parents' flooding emotions**. [...] In responding to the self-reflection questions, you may have found that certain topics brought up a sense of something being raw or unfinished. In the formal interview, an individual with a history of ambivalent attachment may seem preoccupied with certain experiences from the past; for instance, the leftover emotional issue of a sibling favored by a parent may feel fresh and quite alive. It isn't disorienting as in unresolved trauma or loss, but it is preoccupying and upsetting. As ambivalent attachment amplifies attachment needs, there may be a sense of feeling alone or unseen that remains from childhood and gets experienced often in the here and now in ongoing relationships as a sense of anxiety and uncertainty. [...] individuals with the ambivalent attachment model often respond to attachment interview questions by appearing to feel "intruded upon" by the narrative reflections they inspire. This can be explained on the level of brain science by the additional finding that these individuals display what could be seen as a right-sided excess without the calming effect of the left. The left portion of the brain cannot sort through the bombardments from the excessively active right hemisphere, and as a result, images, feelings, bodily sensations, and fragments of unsorted autobiographical recollections may inhibit the left's attempt to provide some kind of linear, language-based, logical telling of their personal narrative."

Here are some simple practices if you've had a history of ambivalent attachment:

1. *Cultivate the ability to name your internal emotional states. "**Name it to tame it**" [...] simply describe what you feel; you don't need to explain it.*
2. ***Journal writing** [...] Narrating your life can become an important integrative tool to build the connections between your two hemispheres.*
3. ***Know your emotions.** For many, knowing that feelings are not facts helps to sort through the sometimes intense and rapid internal emotional world that may arise, especially in the face of relationship challenges. **Feeling rejected** [...] **can activate the same neural circuitry in the right side of the brain that represents bodily pain.***

Knowing this, you can use your "Name it to tame it" skills to acknowledge the pain of a feeling of disconnection and recognize that it may feel overwhelming but actually is not—in fact, it is something you can learn to reflect upon and calm.

4. *see how you can connect with others in close relationships in a more satisfying way for all of you. Keep in the front of your mind whatever feelings arise, knowing that feelings are indeed not facts. You may at times have sensitivity to others' signals that makes their feelings enter you more fully and flood your sense of being a differentiated individual.*
5. **Attachment can feel like a life-or-death matter.** *When we are very small, we rely on our parents or other caregivers for everything—for food, for water, for protection. If we were cared for by unpredictable caretakers, we may still feel, as adolescents or adults, incredibly frightened and unprotected when something stressful happens in our lives. The increased attachment needs of this form of ambivalent attachment can feel, literally, like a matter of life or death. Knowing this can greatly help you to name this sensation, see it for the attachment-based emotional reactive state it is, and then not take it so personally as you acknowledge the emotion without allowing it to swallow you up.*
6. **Strengthen your internal observer.** *Developing a part of your mind that can observe, witness, and narrate your experiences can be a powerful way to "own" what you are going through within relationships. **When you realize that your past experiences may have been foggy or stormy not because of something "wrong" with you, but simply a reflection of the kinds of emotional communications with your caregivers, then you can see how such emotional weather patterns now may simply be echoes from the past.** Having your observing mind narrate how this is all unfolding can give you the emotional space to calm your internal state and see what is happening in your ongoing relationships with more clarity.*

"When we make sense of events in our lives that made no sense, the mind can become coherent, our relationships more fulfilling, and our brains function in a more integrated manner. That's the movement from disorganized attachment with its unresolved states to resolution and security. **One way to think about unresolved trauma or loss is this. The brain first embeds experience in those implicit layers of memory that form the foundation of how we remember things. These building blocks include our emotions, our perceptions, our bodily sensations, and even our behavioral responses.** [...] these building blocks of implicit memory become integrated by a limbic region, the hippocampus, into the two forms of explicit memory of facts and autobiographical recollections. [...] factual memory lets us know that something happened even though we may not know when or have the feeling of being in that experience. Autobiographical memory is dominant on the right and has the

qualities of a sense of self at some point in time in the past. [...] **one aspect of dissociation and unresolved trauma or loss is that the movement from implicit memory to explicit is blocked. When this blockage occurs, implicit memory in its pure, un-integrated state has the important characteristic of not being labeled as coming from some time in the past.** So when a person with disorganized attachment and unresolved trauma or loss is trying to respond to questions about those experiences, the **raw implicit memories are retrieved and the individual is flooded with sensations, emotions, images, or behavioral impulses that feel as if they are happening now.** There is no sense that these are images or feelings from the past. [...] Knowing about these processes of implicit and explicit memory, of unresolved trauma and loss, and of disorganized attachment and dissociation can be an essential starting place on the road to healing."

Following are some simple practices to develop greater security and resolution if you have had a history of disorganized attachment in your life:

1. Keep a journal and be sure to write about times when your internal world may have felt it was fragmenting. What were the triggers that preceded such dissociation?
How did you first know you were beginning to "unravel"? What enabled you to go from this state into a more integrated return to your usual functioning? The journal entries will be of great value as you reflect on what the common triggers were across different episodes in your life.
2. Knowing that disorganized attachment is a model that you may have had in response to terrifying and disorienting experience of trauma or loss in your life, it can be quite helpful to review those attachment questions that evoked particularly strong reactions from you in the process of reflection. Returning to those questions and diving more deeply into your present and past responses can illuminate which areas may be left unresolved. SIFT your mind for sensations, images, feelings, and thoughts that may arise as you ask yourself about any times you felt terrified in your childhood, any times you felt rejected or abandoned, and any losses you experienced. Focusing on the breath for a few minutes can help you as you explore these in your experiences.
3. **RAIN heals the pain:** [...] We recognize the trauma or loss, accept that it has occurred and may be in a state of not being resolved, investigate the nature of the experience in our past and present lives, and have non-identification with the experiences, meaning that we don't let those events define our identity.
4. In SIFTing through your internal experience, there may be times when you feel that you are getting overwhelmed [...] putting one hand on your chest and another on your abdomen can be soothing for many. You can also try a research-established approach of putting a hand on each shoulder, left to right, then right to left, and then alternately

- tapping each shoulder in what is called a "**butterfly hug**"
5. If you find that particular areas in your explorations continue to be terrifying, sometimes seeking professional support can be helpful to move from unresolved to resolved trauma and loss. [...] **A loss or trauma can be like a splinter in your foot during a hike. Once there, it becomes difficult to walk and the splinter becomes more irritated. The longer you try to simply ignore the situation and adjust to the splinter, the more you may limp along the trail. Taking the time to remove the splinter, either by yourself if you can reach it, or with someone's assistance if it is out of your reach, can greatly help your journey.**
 6. If you are still living with or interacting with someone with whom you feel you have unresolved issues, when you feel strong and clear inside yourself, it can be very healing to go to that person and attempt to make a repair. Please keep in mind that the other person may not be in the same state of mind to make a reconnection with you, and being rebuffed because of this may lead to even more painful rejection or anger. Nevertheless, simply knowing that repair can be quite healing, just imagine that this may someday be possible when you and the other person
 7. Whether or not the other person is able to communicate with you about these issues of terror and loss, the growth really begins and ends with your own internal work. **If you find that implicit memories of past experiences of loss or trauma still intrude on your life, you can work on your journal writing, in conversations with close and trusted friends, or with a therapist to help bring these unresolved issues toward resolution.** [...] Healing is possible no matter what happened to you.
 8. Disorganized attachment and its unresolved trauma and loss, like the other non-secure models of attachment, can be transformed through your relationships and your reflections. If you are a parent and have had the opportunity to reflect on how such experiences in your own past may have led to some terrifying behaviors that frightened your offspring, **it is never too late to make a repair.** Begin with your own internal work, and then move to make a reconnection with your teen or older adolescent. I've even worked with adult children whose parents have had the courage to reconnect with them after decades following such disconnecting experiences. Sooner is better than later, but making the move when you are ready to acknowledge what has happened and bring the issue into the dialogue with your offspring can be a crucial step toward healing for everyone involved in what is often a cross-generational passage of disorganized attachment.

MINDSIGHT TOOLS #3: Time-Between and Reflective

Conversation

"Relationships in which you feel felt by another person—when you sense that your internal world, your mind, is taken in by another and respected—are the building blocks of health. [...] **Feeling felt is the fundamental experience of a secure relationship**, whether it is between friends, romantic partners, teachers and students, or parents and their offspring, older adolescents included."

"Our attachment experiences with our own parents create a starting place where we learn the first lessons on how to be with our own emotions, how to reflect on our inner life, and how to have reflective conversations with others. [...] With these earlier lessons having shaped the deeper parts of the brain, our emotional circuitry, we set our course as adolescents into the wider world. Reflecting on those relationships can free us, at whatever age, to make the life we choose rather than live a life that has been chosen for us. [...] For someone with an avoidant model of attachment, depending upon others may make him or her feel like a weak person. [...] As with each of the attachment models, shame may arise when we don't have connections to our caregivers in a reliable way. [...] For others with a history of ambivalent attachment, we've seen that the flood of feelings from the lower regions of the nervous system moving up into the non-verbal right hemisphere can create a sense of being overwhelmed. If this is your history, we've seen that reflecting on your past and building the balance of the left hemisphere's more distant, analytical approach to weaving your life story can be an important and life-changing strategy. [...] Having a history of disorganized attachment experiences in which you may have felt terrified of your attachment figure may have left you with a tendency to dissociate—to disassociate your usually fluid flow of thoughts, feelings, and memories as you interact with others and reflect inwardly within yourself. Be patient with yourself. Dissociation is a developmental outcome of being terrified, and it can itself be terrifying. Journal writing, reflection, and being open about what is happening internally can all be helpful starting places on the journey to heal and to connect with others. [...] If you need time to simply collect yourself when things get intense, find a way to request that with a mutual understanding that this is simply what you need while engaging in reflective conversation. In avoidance, we can't just block out one kind of feeling: **When we shut off a feeling, we usually shut off all our feelings.**"

"Studies of the brain clearly show that reflection, inward or in communication with others, stimulates the activation and development of the prefrontal cortex toward its integrative growth. When we study the mechanisms at work for such inner self-knowing awareness and other-directed awareness, we find that what is activated are the integrative prefrontal regions and related areas, including the mirror neuron system that let us sponge up the feelings of others inside ourselves and enable us to resonate with someone else. When we attune to another person and allow our own internal sensations to be shaped by that other person's feelings, we create **resonance**. When we resonate with someone, we come to feel their feelings at the same time as we become more

aware of our own. This awareness includes our bodily sensations as well as our own emotions. We become more self-aware. When we tune in to the inner life of another, we can create compassionate communication, one filled with empathy and caring. [...] **Being grateful is a powerful source of reinforcing the positive experiences we have in life. Sharing that gratitude with another person is a powerful way of amplifying the positive interpersonal connection.** [...] recent studies show that **being present improves our own physiological health, too.** This may sound more like science fiction than science fact, but carefully conducted research reveals that if we can be present for our experience, **if we can be aware of what is happening as it is happening, then we'll improve our subjective sense of well-being and enhance the way our immune system functions and even make our cells live longer!** Learning to be present reduces stress and even reduces the effects of aging on those caps at the ends of our chromosomes, our telomeres."

Part IV: Staying Present Through Changes and Challenges

Ironically, when we fight what we feel, the feeling gets bigger.

How temperament is different to personality. Temperament is what we're born with while personality builds on top of temperament. You can typically tell one's temperament from infancy, while seeing how they become who they are with that foundation as they grow—their personality.

*We all have a **temperament**, which **means the innate predisposition of our nervous system to react in certain ways.** Temperament includes our sensitivity to input from the environment, the intensity with which we react to inner or outer stimuli—like our own feelings from the inside or sounds or sights from the outside world. These inborn characteristics also include the qualities of having a generally positive attitude toward life and whether we enjoy or react negatively to change and novelty. One way to describe **personality is that we can have a general tendency to activate one of three major emotional states of distress: fear and anticipatory anxiety, sadness and separation distress, and anger and rage.***

"We all have a temperament, an inborn propensity of how we respond. [...] With adolescence, the changes that emerge may intensify some of those earlier characteristics from our childhood as we face the challenges that arise. But for many of us, in fact **for the majority, our childhood temperament does not predict how we'll be in our teenage years or beyond.** [...] For about 80 percent of children, their temperamental characteristics are in the "middle range" of values, and experience plays a larger role in shaping their paths. For 20 percent, 10 on either end of a spectrum of typical temperamental characteristics, the extremes of their temperament seem to be associated with the persistence of nervous system tendencies such as sensitivity or aversion to novelty. Experience plays a role in the development"

"even with a history of secure attachment. life will continue to be distressful and challenging. You may not have a formal disorder, but you may be experiencing significant and real distress. [...] **after ninety seconds an unimpeded emotion will begin to transform on its own. It is often how we fret over a feeling that creates suffering and maintains the intensity and duration of that feeling**"

He who suffers before it is necessary suffers *more* than is necessary.
—Seneca

"children are sexually maturing at earlier ages, especially girls—sometimes before hitting their double digits—but their brains are not maturing at this same rate."

"adolescents begin to act in very distinct ways with different groups of people. They may have one "persona" or way of being with fellow teammates in soccer club, another with friends from school, and another with siblings or with parents. During this early adolescent period, studies show, there is often little awareness of these distinct "ways of being" or "states of mind" that can dominate and distress teen and adult alike."

"in our evolutionary past, there was a much quicker transition that bridged the divide between sexual immaturity and adult responsibility. By the time physiological sexual maturity happened in the middle to late teens, we were socially set up to make sexual connections with others and ready to make babies.

Now we have a prolonged period of adolescence in which sexual feelings emerge with maturation but pair bonding (finding a mate and creating a new family home) does not occur until much, much later. In modern cultures today, these informal sexual connections sometimes shape how an adolescent first realizes his or her sexual life."

"Some researchers, like Helen Fisher, suggest that at least three kinds of love exist [...] When we are romantic we "fall in love" and have a deep sense of longing to be with someone, think about the person when he or she is not around, and feel a deep sense of loss when they leave. [...] That's **the "addiction" part of love** that drives poets and songwriters to devote so much time and energy to trying to express the pain and pleasure of romance. Like other forms of addiction, scientists think dopamine may be the main neurochemical involved in this aspect of love. [...] The very parts of the brain that register bodily pain also represent the pain of a severed relationship. It can feel like we are being stabbed and are dying. Then there's the sexual or erotic aspect of love, the attraction and Sexual arousal. This libido or sexual energy is a natural part of our experience. It doesn't always come along with romance, so these two feelings can be somewhat independent. This form of love may be primarily mediated by androgens, a form of hormone associated with increases

in sex drive. [...] For some, sexual intercourse involves not only the androgens that help mediate arousal but also the secretion of oxytocin, the hormone that generally intensifies our feelings. [...] this intensification can be, especially for males, an intensification of jealousy and aggression. For others, especially intense for females, sexual intercourse is associated with oxytocin release; the person one is with becomes the person of one's bonding. [...] Attachment is the kind of love in which we want to offer the nurturance that others need to help them feel safe, seen, soothed, and secure."

"When a family pushes for only one set of feelings or identities to be "permissible" **authentic feelings [...] simply go underground, they don't disappear.**"

Addiction during adolescence...

*There are at least **four fundamental drives** that can motivate our increased use of drugs during the adolescent period. These include **experimentation, social connection, self-medication, and addiction.***

*For an adolescent whose **dopamine release is already revved up**, drugs, including alcohol, that directly increase the release of this transmitter create an especially challenging mix of **drug-enhanced dopamine levels on top of an already activated adolescent dopamine system.** In other words, adolescence is a period not only of drug experimentation to explore novelty, but also of vulnerability to becoming physiologically drawn to using and becoming addicted to alcohol and other drugs. [...] the dopamine system is more reactive in a teen, with heightened release that drives our reward and sensation-seeking behaviors [...] the baseline levels of dopamine during adolescence are actually lower. What this means is that **teens may be prone to feeling "bored" unless they are engaging in novelty-seeking behaviors.** An adolescent's dopamine profile has lower troughs, higher peaks. [...] Novelty itself is rewarding and also activates our dopamine release. [...] Some drugs used for the purpose of altering consciousness do not involve dopamine, and because of this they may influence a person's life but not be addictive. This drive to expand consciousness and see life with new eyes is important for some drug users, adolescents or adults, but for others it is merely a drive to experience something new without a search to understand new meanings of life. [...] The experimental aspect of the use of alcohol can be an important dimension that drives an initial interest in drinking and getting drunk. [...] But in the setting of group alcohol use, the tendency to engage in binge drinking, consuming large amounts of alcohol in short amounts of time, is an especially risky behavior [...] alcohol poisoning has been clearly demonstrated to kill brain cells and their connections, especially in regions that control attention and memory.*

Repeated bingeing damages the brain. [...] The lowering of social anxiety and the lowering of defenses make many people feel more at ease in social settings, and so these drugs are used as a "social lubricant" that facilitates communication. [...] someone with depression may feel so down in the dumps

that she wants to "go numb" by frequently using alcohol or she may get herself "revved up" by using amphetamines. Someone with mania as a part of manic-depressive or bipolar illness might use alcohol or barbiturates to slow himself down. A person with schizophrenia might use alcohol to quiet the hallucinations and delusions that are terrifying for him. For others with attention deficit difficulties, the use of stimulants may temporarily increase the focus of sustained attention. And for individuals with social anxiety, taking alcohol may decrease their concerns in social situations, whereas smoking marijuana may inadvertently lead to an increase in their panic. [...] Tolerance isn't necessary for addiction, but it can be present and be an important sign of a larger issue unfolding. [...] Addictive substances and addictive behaviors [...] involve the reward circuit's major transmitter, dopamine. [...] **Dopamine is released from a brainstem-related area, the nucleus accumbens, and influences our limbic emotional, motivational, evaluative, and memory systems, and even pushes up into our cortex to influence our thinking, decision making, and behaviors.** Alcohol can activate the dopamine system in anyone, leading to surges in this reward-based brain chemical. Beyond stimulating a dopamine surge that is especially intense in adolescents, alcohol and other drugs have an impact on the way our minds see reality, as they dampen cortical functioning and alter our conscious experience of the world. [...] Adolescence is a period of great risk for not only using mind-altering drugs but also abusing them and becoming addicted to them. As adolescents we begin to experiment with many drugs that activate the dopamine system, and it is during our adolescent period that the brain is most sensitive to becoming addicted to a substance. Our changing adolescent brain is especially vulnerable to respond to drug use with the onset of a cascade of behavioral and physiological responses that can contribute to addiction. [...] The earlier in adolescence we are exposed to alcohol and drugs, the more likely we are to develop an addiction. Think of it this way. **Addiction is where we get used to the dopamine surge an activity or substance creates in the brainstem and limbic regions that pushes our cortex to make decisions regarding our behavior to continue to do things that may be destructive to us.** In fact, a simple way of defining an addiction is when people continue to do something that is destructive even after they know it is hurting their life. [...] It is true that **once you are intoxicated, the very prefrontal regions that would help you decide to stop drinking go off-line.** Even one drink, for some individuals, can create sudden and intense shifts in judgment—like the discerning judgment not to drive a car while intoxicated. [...] while you were drinking, your limbic memory region, the hippocampus, had so shut down that, afterward you simply don't recall what happened to you. [...] For some individuals who experiment with drugs and alcohol to alter their state of mind temporarily, such dopamine-surge-driven behaviors lead to an alteration in their lives in long-term ways. Some studies suggest that in those at risk, and especially during our adolescent period, a gene inside our brain's motivational circuitry is activated when a particular substance is ingested. Once this gene activation occurs, the dopamine circuit locks on to a certain "substance of choice" and an intense focus of attention, thought, energy, and behavior is directed to the substance.

*[...] this dopamine surge is released not only when taking the substance but even when planning to take it, when thinking about it, when being around people with whom it has been taken, when in similar rooms where it was taken, when getting ready to take it. In short, the intense release of dopamine, which gives you the feeling of urge and the drive for reward, occurs both with the ingestion and with the intention behind use of that substance. [...] We can enjoy an experience of flow and that feeling of a job well done, of hard work completed, of an accomplishment well earned. When a substance or behavior of addiction happens in those at risk, then there is a surge in dopamine that feels thrilling and compelling and good and rewarding and something that needs to be repeated, and repeated soon. [...] We've gotten used to the dopamine thrill of the peak, and we've become bored with the dopamine trough. [...] **addiction is a life-consuming challenge, not just something we do because we are choosing it.***

MINDSIGHT TOOLS #4: The Mindsight Simple Seven

"I'd like to introduce you to seven activities you can do on a daily basis that are scientifically proven to keep your body healthy, your mind strong, and your brain continuing to grow in integrative ways throughout your life. Research into the brain's ability to change and develop in response to experience, what is referred to as "neuroplasticity," reveals that regular practice of these activities can activate the growth of neural connections, and even new neurons. [...] **SNAG—stimulate neuronal activation and growth.** Scientific investigations have shown that when we do the seven activities that follow, we SNAG the brain toward growth, and that growth is often in the direction of integration."

The exercises are: sleep time, time-in (aka mindfulness), physical time, downtime, playtime, focus time, connecting time

"Time-in practiced on a regular basis has been shown to stimulate the growth of many fibers in the brain, especially the integrative ones that help regulate attention, emotion, and thinking."

"the mindful awareness of time-in that supports your being present for whatever arises in your life also helps to increase your levels of the enzyme telomerase, which repairs and maintains the ends of your chromosomes that help keep your individual cells alive and healthy. That's not a joke—taking time-in makes your cells healthier! In addition, your immune system will function better and you'll have more energy, and even develop a more resilient way of approaching life's challenges because of specific ways your brain will change."

"for optimal **brain growth**, for optimal **memory consolidation** of the day's learn-ing, for optimal **insulin function and food metabolism**, to **keep fit**, for optimal **immune function** to fight off disease, for **optimal response to stress** to deal with life's hassles, and for optimal **mental functioning**, with effective abilities for **focusing attention, thinking, remembering, problem solving**,

handling your emotions, and connecting with others in relationships, you need at least the lesser amount of your range of sleep."

The best amount of sleep is roughly 8-9 hours/night for teens. Best to be asleep by 10pm though as between 10pm-2am, if you're awake you're dopamine function for the next day is shot to bits. That means your baseline shifts even more, and for a teen this isn't good. More on this from Huberman Lab.

"What's the outcome of inadequate amounts and quality of sleep? The brain doesn't grow well, memory is not consolidated and you don't remember what you learned, insulin doesn't work right and becoming overweight is more likely, stress hormones rise and make you feel lousy, immune functions don't work well and you can get sick more easily, and your mind won't be as sharp for paying attention, thinking, and problem solving."

A list of simple daily sleep habits:

1. Turn off digital objects and electronic screens at least an hour before you go to bed. These objects—computers, smartphones, televisions—keep your brain thinking it should be wide awake.
2. If you have trouble falling asleep, try turning down the lights a bit in the half-hour before you get into bed.
3. Try not to do work or homework in bed. The bed should be for restful activities, not associated with working.
4. Be mindful that caffeine in soda, coffee, or tea can keep some people up at night. This also includes chocolate, unfortunately. So watch when you drink and eat these substances, and make sure you are not consuming too much overall or too late in the day for you to easily fall asleep and maintain sleep through the night.
5. Some people like to take a warm bath before bed. Others like to drink a glass of milk or some other beverage containing calcium, which can help you sleep.
6. Some like to write out the day's events in a journal so that they are not worried about things when they fall asleep. If that works for you, great! Keep in mind that journal writing has been shown to improve the immune system, and it helps resolve challenging issues in your life. Others find journal writing right before bed too stimulating. Naturally this is true if you are keeping a digital journal on a back-lit screen, so try using a paper journal for evening reflections. See what works for you.
7. The amount of continuous sleep you get matters. So set up the evening accordingly, keeping in mind when you need to get up the next morning. Eight to nine hours is a range to aim for. See what your natural needs are, no matter your age. Over a week's time, give yourself plenty of time to sleep.

"the brain changes in response to experience. The brain is built to focus on one thing at a time, processing it into more elaborated forms, connecting it to similar items, linking it to others, and then consolidating all of the neural firing into long-term structural changes. [...] When we focus intensely, we do three things in the brain. One is that the part of the brain just above the brainstem-palm secretes an important chemical, acetylcholine, throughout the brain. A second thing is that paying close attention intensely activates specific circuits. **When neurons fire together, they wire together.** And this brings us to the third: **When we pay close attention to one thing, the acetylcholine bathing those activating circuits works with the localized release of another neurochemical, brain-derived neurotrophic factor, or BDNF, to optimize how genes become expressed to produce the proteins necessary to strengthen the connections among those firing neurons.** In short, **when you pay close attention, you optimize neuroplastic changes that are the basis for learning.**"

Adults without the projects that enable them to closely pay attention to something can begin to feel like life has become a rut, unchanging, and boring.

"Downtime is when we have no plans, nothing we are trying to accomplish, nothing that needs to be done. During this period the brain seems to recharge its batteries, allowing the mind to intentionally be given a break."

"When we move our bodies, neuroplasticity is enhanced. We remember more, we grow more connections in the brain, and we solidify those connections."

A brief commentary:

The ESSENCE of adolescence is what this book's all about. (Emotional Spark, Social Engagement, Novelty, and Creative Exploration.) Siegel cleverly composes an acronym to describe the main brain features that occur between 12-24 years. Contrary to what many think, adolescence isn't a period of 'raging hormones.' Sure, hormones rage, but the brain's restructure is where the answers lie. Siegel says something like a 'renovation' occurs in the brain where huge chunks of brain matter is lost, repurposed, restructured, weakened, and strengthened—this is why there are so many shifts in behaviour and emotion in an adolescent. Kids lose interest in what they used to find interesting and become 'specialists' rather than 'generalists' (they go, for example, from five sports down to one or two, only able to give their attention to the one that sparks the most passion). **Emotional Spark** refers to increased emotional expression (both 'positive' and 'negative'). **Social Engagement** describes the important shift away from family and caregivers towards friendship groups (an important steps in maturation that must occur if a child is to avoid a 'failure to launch' and embrace independence). **Novelty** describes the pull towards the

new. Teens have lower baseline dopamine levels (meaning they get bored much quicker than preteens and adults) and therefore crave novelty to feel good about themselves, their world, and others. **Creative Exploration** describes how people start questioning what they believe, what they're interested, and who they are as a person. I found it fascinating that if you can't progress through this period, safely navigating these categories, you're less likely to adjust into adulthood. And adults who are fed up with or envy the adolescent won't be satisfied with their own lives.

These notes were collected by psychotherapist and author Emil Barna in his efforts to assist with professional development and further education for himself and those who read them. You can find out more about Emil by visiting www.barnacc.com

"A text without a context is a pretext to a proof text."
—Dr. Don Carson