

How to Enhance Connection, Happiness, and Ease: The Neuroscience of Self-Regulation

Jeffrey S. Rutstein, PsyD, CHT

jr@drjeffreyrutstein.com drjeffreyrutstein.com

Introduction:

For thousands of years, we humans have longed for improved relationships, lasting happiness, and freedom from struggle, fear, and pain. Our collective craving has created no shortage of attempts to quench that thirst, including religion, philosophy, psychology, education, alcohol, personal growth workshops, and even dating apps. And yet, you may find that despite all of your best efforts you don't feel better or that much different. Your happiness doesn't seem to last, you may continue to struggle with connection and intimacy in relationships, and you may not be enjoying much ease in your life.

Recently, a new client put it this way: "I've done cognitive therapy, traditional talk therapy, group therapy, even drama therapy . . . I was a philosophy major in college, and over the years have participated in so many self-growth workshops and trainings I've lost count. I feel I have good insight and understanding about my problems, but when it comes to living life the way I want to—to be the way I want to be—I constantly find I go right back to how I've always reacted and what I've always done. It's so frustrating and disappointing. This really needs to change and nothing I've done so far has helped."

For over 100 years, psychologists and psychiatrists have utilized talk therapy to try to help people use insight and understanding to manage their behavior and to improve their health, happiness, and relationships. If you were not changing or managing your behavior better, then you simply needed more (or different) therapy! However, mounting neuroscience research has demonstrated that few psychological problems are the result of a lack of insight or clear understanding.

Ironically, it turns out most of your suffering and struggles are, in part or in whole, caused by the state of your nervous system. Ironically, the very systems and tendencies that evolved specifically to help our species survive are now part of what causes you to feel overwhelmed, anxious, worried, irritable, reactive or shut down.

Chances are that your survival responses are getting triggered not by actual life-threatening events such as running from a tiger or engaging in hand-to-hand combat. Instead, your survival responses are likely being triggered by everyday situations such as running late for a meeting, having an argument, feeling ashamed or anxious or overwhelmed, or simply being stuck in traffic.

Whenever your nervous system detects danger (whether real or imagined) and the automatic survival responses kick in, no amount of insight or understanding alone will be able to turn that survival response off. And as long as your nervous system is in survival mode, that response is driving your perceptions, your psychology, your behavior, and your physiology. When you find yourself in an automatic defensive response, you are primed to survive but you are not primed to be happy, relationally connected, or at ease.

Lasting relief can only be achieved through a different pathway.

In this paper, I will explore the conceptual nature of self-regulation and the pathway of befriending and working with your nervous system. To provide you with the best foundation to understand and implement this information, the first portion of this paper will cover the neuroscience to provide context and a map of how to proceed. The second portion of the paper will outline practices and methods for shifting your nervous system and enhancing your ability to savor your life. Please don't jump over this first portion to get to the practices, because your understanding of these initial concepts is essential for you to successfully apply these ideas and practices.

Over the last 30 years, our understanding of how the brain functions and how we can influence it has grown exponentially. One of the most important areas of research about the brain has been the discovery of neuroplasticity. "Neuroplasticity" refers to the brain's ability to grow and form new neuronal connections and circuits between nerve cells within the brain. As our understanding of the brain continues to evolve, new approaches and methods have been developed that can literally help you change your brain for the better. We now know that you can profoundly influence and change the way your brain works and how your nervous system responds to daily life—improving health, happiness, relationships, attention, memory, performance, success, and reducing or preventing anxiety, depression, irritability, and cognitive decline, just to name a few.

Understanding Your Evolutionary Heritage

Your daily experience is profoundly influenced by whether or not your survival responses have been activated. By having a basic understanding of the evolution of your automatic survival responses, you are in a much better position to work with your nervous system rather than against it. Think of the following sections as an owner's manual for your nervous system.

Your Amazing Brain

Your brain—the three-pound blob in your head—is the most complex organ in your body. There are approximately 86 billion neurons that make up your brain, and if you laid those 86 billion neurons in one long line it would stretch approximately 534 miles (860 kilometers). Your brain's health and resilience impacts every aspect of your life. It controls thinking, memory, cognitive efficiency, physical health, emotional health, habits, urges, cravings, resilience, and so much more. Although your brain accounts for less than 2 percent of your body weight, it consumes 20 percent of the body's total energy (Drubach, 2000). The relatively high energy consumption of your brain demonstrates the crucial role it plays in keeping you alive.

Your Nervous System

The human nervous system consists of your brain, your spinal cord, and all the neurons (nerves cells) that run through your body, plus the recently recognized enteric nervous system. It was only recently discovered that there is a mesh-like network of neurons that control the function of the entire gastrointestinal tract. Your gut (the enteric nervous system) has also been called “your second brain.” This is why when you are upset, you feel it in your gut—think of phrases such as “butterflies in my stomach,” or, “I’m so disgusted I feel nauseous.”

From the perspective of evolution and natural selection, the primary two jobs of our brain and nervous system over the millennia were survival and propagation—to live long enough to ensure you pass on your genes to the next generation. Thus, those humans who had nervous systems very responsive to signs of danger and life threat were the ones who lived to pass on their genes. And those early humans who did not have such a sensitive response were more likely to no longer pass on their genes. So, just by natural selection, if you are reading this then your gene lineage has maintained a sensitive threat detection and survival response system. This is great for the survival of your genes, but it also is the source of much of your struggle, dissatisfaction, and pain.

Your Autonomic Nervous System

One part of your nervous system is the autonomic nervous system. This is the name given to the aspect of your nervous system that automatically controls activities that are crucial for your survival, such as breathing, heartbeat, blood pressure, digestion, sexual response, and body temperature. This system also controls your defensive behaviors, such as fight-or-flight response.

We used to think that the autonomic nervous system had only two pathways: the sympathetic branch for fight or flight, called “the stress response”; and the parasympathetic branch for rest, repair, and digestion, called “the relaxation response.” In this two-branch model, one system increased your activation and the other system reduced your activation. However, that all changed with the introduction of Polyvagal Theory.

Polyvagal Theory

When Stephen Porges, PhD, published his research findings in 1995, he could not have foretold the profound impact they would have on neuroscience, psychology, interpersonal neurobiology, and the fields of education, performance enhancement, and healing trauma. He developed the polyvagal model of the autonomic nervous system, which has transformed our understanding of the autonomic nervous system and healing in very exciting and promising ways.

This perspective is empowering because it provides a map and a perspective to better understand your nervous system and how to shift it toward healing, intimacy in relationships, peak performance, more happiness, and improved learning. In the following sections, I will briefly cover the main relevant points of Polyvagal Theory.

Neuroception

Without you knowing it consciously, your nervous system is constantly monitoring, scanning, and sensing whether people, places, or situations are safe, dangerous, or life-threatening. Within the Polyvagal Theory, Porges distinguished the conscious process of perception—for instance, I am aware I am seeing my computer screen while I write this—from the constant automatic scanning and sensing for danger or threat that occurs outside of conscious awareness. Porges termed this subconscious, automatic sensing process “neuroception.” Depending upon what your neuroception detects, it will determine what state you are in: threat detection and threat response, or feeling safe and connected.

Once your neuroception detects danger or threat, your autonomic nervous system springs into action to respond to the situation. You either get launched into fight-or-flight or you dive into shutdown and immobilization. This happens quickly—often before you are even conscious of what the threat or danger might be. Sometimes, your neuroception will detect danger and lack of safety in situations that are actually relatively safe from a survival viewpoint. Dr. Porges calls this “faulty neuroception,” and it occurs more often than you may think.

Dr. Porges observed that many psychological problems such as anxiety, depression, impulsivity, and addictions may be the result of faulty neuroception. Faulty neuroception can be one that is biased toward detecting danger even when there is no real danger. The more you improve the accuracy of neuroception, the more you will reduce the problems that arise from it. In a later section, we will explore specific practices to help increase the accuracy of your neuroception, offering you methods to shift from chronic survival response activation.

Three Distinct Branches to Your Survival System

Unlike the earlier version of a two-branch survival system, Porges found there are three distinct branches and functions to the autonomic nervous system. His insights have revolutionized our treatment of trauma and of many other mood and performance issues. In response to perceived danger, we will shift into the hyper-aroused state of fight-or-flight response, and in response to life threat, we will shift into the hypo-aroused shutdown response. In contrast, when we are feeling safe, we shift into this very important third branch of the autonomic nervous system that Porges calls the social engagement system. To better appreciate the importance of the social engagement system, it is helpful to see how each system evolved and how they help us survive.

Evolutionary Hierarchy of Survival Responses

Dr. Porges differentiated the historical evolution and hierarchy of these three branches of the autonomic nervous system. Understanding this hierarchy will help you track, befriend, and work with (rather than fight against) your nervous system.

The Shut-Down/Immobilization Response

The shutdown response of hypo-activation is the oldest and most primitive. You can see this response in reptiles. It is partially controlled by the oldest part of your brain—the brain stem, also called “the reptilian brain.” In reaction to what is perceived to be a life threat, this branch activates immobilization behaviors such as numbness, dissociation, fainting, feigning death, and shutting down. This is also the most limited survival response in that it renders you incapable of actively defending yourself. In this state, you are inactive, your metabolic rate is lowered, you have very low energy (hypo -roused), and physical movement is dramatically reduced or nonexistent. While this might work well for reptiles who are cold-blooded and can easily survive lowering their metabolic rate and playing dead, this does not work as well for humans for a variety of reasons.

Symptoms of the Shutdown/Immobilization Response (a.k.a. Hypo-Arousal)

- Shutdown
- Reduced awareness of sensation
- Emotionally numb or flat
- Unable to think
- Dissociated
- Memory impairment
- Sleepy/unable to remain awake
- Spacey
- Fainting
- Unable to move
- Reduced physical movement
- Lethargic/no energy
- Disconnected
- Depressed
- Passive
- Ashamed
- Withdrawn
- Less verbal
- Less or nonresponsive
- Unable to actively defend yourself
- Feigned death

The Fight-or-Flight Response

Next to evolve is the fight-or-flight stress response. This defensive response, which all mammals share, is an active defense strategy—you can fight or run away to save yourself. In this state, your heart rate increases, your digestion shuts down, your pupils enlarge, blood is directed toward your muscles; in short, your physiology is being primed to actively fight or flee. In this state, your energy is high (hyper-aroused)

and you are ready for action.

Symptoms of Fight-or-Flight Response (a.k.a. Hyperarousal)

- Fight or flight
- Emotional overwhelm
- Rigid and inflexible
- Impulsivity
- Tension
- Anxiety
- Panic
- Phobias
- Self-destructive behavior
- Emotional outbursts
- Addictions
- Overeating or restricted eating
- Obsessive rumination
- Rage
- Irritability
- Emotional reactivity
- Defensiveness
- Restlessness
- Racing thoughts
- Jittery or shaky
- Exaggerated startle response
- Intrusive imagery
- Feeling unsafe

Social Engagement System (Also Referred to as the Social Communication System)

Finally, the most recently evolved branch, which only mammals share, is called the social engagement system or social communication system. This comes online when you and/or the environment feels safe. Whereas in the previous two survival responses your nervous system is screaming at you to fight, run, or play dead, this survival response system primes you for connection and communication with others. Being in this state enhances your ability to truly bond, attach, and be emotionally intimate with others. Also, your ability to be present and more at ease is likewise enhanced, so you can enjoy and savor life in real time. As Porges (2018) has said, connectedness is truly a biological imperative. We are literally wired to connect with others and to seek mutual and reciprocal relationships. This is where you move out of constant threat detection and threat response and into engagement with others. Or, as Deb Dana poetically writes, you “move from protection to connection” (2018).

Rather than your physiological arousal level being too low or too high, in the social engagement system your physiology shifts into a more regulated and homeostatic state. Here you would feel a sense of calm.

Also, this state is where you shift away from ruminating about problems, constant worry or stress.

Being in connection with others enhances your ability to be regulated sufficiently so that you can access a much wider range of resources, resilience, and options rather than being a slave to your constant fight, flight, or shutdown responses.

Polyvagal Theory also importantly demonstrates that prosocial behavior, social communication, and visceral homeostasis (which is where you heal and repair your body) are not accessed in either of your defensive survival responses. These only occur when you are more regulated and have activated the social engagement system. From a polyvagal perspective, the social engagement state is the optimal state from which to live your day-to-day life, to reap the many benefits from being connected to others in mutual and reciprocal relationships, and nourishing a happier, calmer, and more interpersonally connected you.

“Polyvagal Theory can be thought of as the science of feeling safe enough to fall in love with life and take the risks of living.” (Porges and Dana, 2018, pg. 188)

Another Survival Response?

Recently, another survival response has been identified, and is called “the tend-and-befriend response” (Taylor, et al., 2000). This important study came from a group of researches that noted almost all stress and survival response studies were historically conducted with men as the research subjects. This group wondered if women might have a different response.

They found that women indeed go into fight-or-flight activation less often, and instead engage the tend-and-befriend system. The researchers suggested that fight-or-flight behavior was not always be the most advantageous response for women and their offspring. Unlike men, women would often be unable to fight or flee while pregnant, nursing, or taking care of their young children. Instead, Taylor and her colleagues propose that since fight or flight may not have been viable options, females evolved this alternative strategy that focuses on tending to and caring for the children as well as befriending other females so that in times of stress or danger they have a social support network that can increase their and their children’s chances of survival. A group of humans or mammals have a much better chance of survival than a lone member. Therefore, befriending was an evolutionary advantage for survival.

It has been also been observed that in recent times males may also be beginning to include the tend-and-befriend response as an alternative to fight-or-flight. As such this response is clearly spreading beyond females only.

The tend-and-befriend response is not separate from the social engagement system. Indeed, it is an option that is available only when your social engagement system is activated..

The Window of Tolerance

Window of Tolerance

Hyperarousal

Dysregulation

Window of Tolerance - Optimal Arousal

Dysregulation

Hypo-Arousal

Dan Siegel, MD, (2010) coined the term “Window of Tolerance,” which refers to the zone of optimal arousal (not too much, not too little) where you are able to manage and thrive within daily life.

The above graphic of the Window of Tolerance is helpful to visualize and understand that the range within which we function best is a balance between hyperarousal and hypo-arousal. And when you begin to shift from your window of tolerance into either hyperarousal (fight-or-flight) or into hypo-arousal (shutdown/immobilization), you will find that is when you experience symptoms of anxiety, rage, depression, confusion, and dissociation.

Furthermore, Siegel (2010) points out that when you move out of your Window of Tolerance and into either fight, flight, or shutdown, your responses are driven by the evolutionarily older reptilian and mammalian structures in your brain, while the most recent part of your brain that is responsible for conscious thought and language—the neocortex—is suppressed. Siegel calls this “flipping your lid.” This happens because you need to instantaneously respond on instinct to a threat rather than the much slower process of having to think about and plan your response. The very fast circuitry of your autonomic threat detection leads the evolutionarily older parts of your brain to make decisions based on just partial information. For example, the possible survival cost of a mistaken reaction to a curved stick on your walking path is small compared with the potential cost of actually stepping on a live venomous snake.

When your lid is flipped, you will be operating without the benefit of rational thinking and decision-making, and without your ability to plan and organize a response to the situation. In this state,

you are much more likely to be impulsive and reckless. This is why when you are in either of the defensive states you will find that your thinking is impaired. So, in addition to being very agitated or upset, you are at a disadvantage because you are less able to use your brain to problem-solve.

To help you cultivate greater self-awareness, here is a partial list of signs that indicate you are in your Window of Tolerance:

Signs of Being in the WINDOW OF TOLERANCE—a.k.a. the Social Engagement System

- Here you can feel your emotions and think about them at the same time
- Feelings and experiences are tolerable
- Access to compassion and empathy
- Ability to learn
- The thinking, rational part of your brain is online
- Feeling safe
- Able to be present
- Able to be curious about your feelings and experiences (rather than reactive, defensive, and judgmental)
- Feeling open rather than closed off
- Able to feel connected in a mutual relationship
- Feeling grounded, centered
- Feeling calm

Dysregulation

“We don’t see things as they are; we see them as we are.”—Anais Nin

Dysregulation occurs when you are outside of your Window of Tolerance and are experiencing any of the symptoms of hypo- or hyperarousal. Not only is being dysregulated uncomfortable and distressing (to say the least), it also profoundly impacts your ability to accurately assess a situation and to skillfully respond in the present moment. When dysregulated you make split decisions and you react based on less—and often inaccurate—information. In dysregulation, your brain is primed to jump to conclusions, make inaccurate assumptions, and respond from a defensive place. Being activated in either of the defensive states can cause problems and suffering for you in your work and home life. We are far from being our best self when we are either in the over-activated or under-activated states of defense.

And while you are in fight, flight, or shutdown, learning and creativity are offline and you have diminished access to your knowledge, compassion, and wisdom.

Your survival wiring is preemptive. So, once your defensive states are triggered, you are controlled by them unless you actively do something to shift out of the defensive state.

Bouncing from State to State

If you look at your life through the lens of Polyvagal Theory, you will find that you move in and out of defensive states throughout a normal day. Perhaps the rush to work or an obligation activates a fight-or-flight response. As such, you may feel anxious and pressured, as well as irritable and angry at anyone or anything that gets in your way when you are late.

“The autonomic nervous system responds to the challenges of daily life by telling us not what we are or who we are but how we are.” (Deb Dana, 2018)

Have you ever had the experience where you felt under intense pressure to get something accomplished on time? Perhaps you were feeling anxious, irritated, or both about having to quickly complete a big task. Maybe you were feeling overwhelmed. Then you suddenly found yourself needing to take a nap. You became so tired you couldn't keep your eyes open any longer. It can feel as if you were suddenly sedated, or you fell into a trance-like shutdown state and spaced out. You just bounced from hyperarousal to hypo-arousal.

From this perspective, you can see that many emotional states and reactions you might experience during a typical day are a manifestation of your nervous system being dysregulated and shifting into a state of hyper- or hypo-arousal. A brain-wise perspective is wonderfully destigmatizing and liberating. Usually, we tend to blame ourselves rather than our brain state. You might say, “I am an anxious person,” or, “I’m an angry person,” “a lazy person,” or “a gluttonous person.” When we identify with a state of arousal (either hyperarousal or hypo-arousal), we are mistaking the state of our nervous system for who we are. This common error is the source of much suffering, blame, and shame. However, it’s more accurate and empowering when you view physiological states of fight, flight, or shutdown as merely neurological states rather than who you are as a person. There is a huge difference when you move from making a global statement such as “I’m an anxious person,” to saying, “I feel anxious,” or, “I feel angry.”

What Is Self-Regulation?

Self-regulation is your ability to bring your dysregulated nervous system back into balance and homeostasis. It is the ability to shift out of dysregulation and defensive strategies and into your window of tolerance, thereby initiating the social engagement system. You already self-regulate daily, but without knowing you are doing so. Every time you get out of bed to go to work even though you would much rather stay in bed, you are self-regulating your behavior. You want to do one thing (stay in your warm, cozy bed) and at the same time also aspire for something larger (a promotion, continued employment, financial survival). To rise rather than fall back to sleep is a type of self-regulation you do often.

Problems arise when you find yourself dysregulated in either the fight-or-flight or shutdown responses, and remain in that state rather than shift out from it.

You can enhance your ability to self-regulate by employing some of many tools, practices, strategies, or methods designed to help shift arousal to a more optimal state and to activate the social engagement

system (some of which are listed below). Learning and using these tools is incredibly empowering and helps you see that who you are is separate from your state of arousal. Truly anyone can learn self-regulation—even a child.

As a child, I experienced severe daily anxiety for years. At age 11, desperate and with no other helpful options at the time, I began to study and practice yogic breath work (pranayama) and meditation. Over time, through consistent practice, I learned I could calm myself down and feel better. The discovery that I could change my state from one of anxiety and obsessive rumination to one of calmness was nothing short of life-changing for me. Learning firsthand how incredibly powerful and transformative these practices are for reducing suffering and improving well-being is a primary reason that I decided to become a psychologist. .

Cultivating Neural Connections for More Interpersonal Connection

When you learn to self-regulate to spend more time comfortably within your own Window of Tolerance, you will also be activating your social engagement system.

When your neuroception then detects safety and you enter the social engagement system, you will probably find that you long for—and will reach for—connection with others. This is our natural human tendency when we feel safe. When you are not busy scanning for or reacting to threats, you will find yourself seeking connection, bonding, play, and shared experience in mutual and reciprocal relationships.

Neuroscience shows us that neurons that fire together, wire together. The more you practice methods of self-regulation and activating the social engagement system, the more you are building these circuits that support safety, connection, and regulation.

“The greatest thing then, in all education, is to make our nervous system our ally as opposed to our enemy.” —William James, circa 1857

So, How Do You Make Your Nervous System Your Ally?

The first step is to notice what is your nervous system telling you about how it is right now. What state are you in?

Pause and try this:

Right here, right now . . . take a few mindful breaths
As best you can, turn your awareness toward your body . . .
See if you can become curious about how your body and mind are right now
As best you can, try feeling with your awareness how your belly is . . .
Is it tight or relaxed?
How about your facial expression?
Is there any tension or gripping or contraction in the body?

Notice the types of thoughts or stories that were just going on in your head before you stopped to do this .

As best you can, simply sense the state of your body and mind in this moment . . . without judgment . . .

Is it relaxed and at ease?

Is it tense or irritated or anxious?

Are you able to feel? Are you numb or feeling empty?

How is your energy? Are you feeling over-activated, hyperaroused?

Are you feeling under-activated, hypo-aroused?

Are you feeling balanced, calm, and present?

Once you get a sense of how your autonomic nervous system is feeling, then you can choose how to respond. Discerning which state you are in determines which practices and methods you use. If you are hyperaroused, then you should choose practices that lower your arousal and energy. Some of these practices include breath practices such as abdominal breathing, singing, chanting, even blowing bubbles. On the other hand, if you are hypo-aroused, you should utilize practices that increase arousal and energy, such as counting and describing objects while moving your head to look around the room, or splashing cold water on your face and back of neck.

To help activate your social engagement system, you can engage in practices to foster a feeling of safety such as a safe place visualization, compassion or lovingkindness meditation, safe touch, or maintaining eye contact during conversation.

Your goal in self-regulation is to balance your energy and activation—to return to your zone of optimal arousal and shift toward social engagement. In that state, you can be present, feel safe, connected, and have access to internal and social resources. Happiness is accessible in the social engagement system. When you are dysregulated into either of the defensive states of hyper- and hypo-arousal, happiness is not on your radar—only survival is.

When we are in the fight-or-flight response, we are primed to fight or to run for our lives. This was needed when we were about to be dinner for some larger predator. When we are in that state, fleeing or fighting are the only actions we are prepared and primed to do. In modern-day life, it is not likely you are running from or fighting predators every moment.

However, due to faulty neuroception or past traumas, you may find yourself chronically over- or under-activated. This may happen so often that you do not really notice. You may just tell yourself, “Well, that is just the way I am.” That is why it is so important to pause and check in with your state of being and to sense how your nervous system is doing right now. Many people are surprised to find they are in a chronic state of hyperarousal. Most of the individuals I work with had assumed that this is the way they were and felt ashamed. They were later profoundly relieved to find they could change what they had believed was unchangeable.

Some individuals, due to genetics, the environment in which they were raised, or life experiences such as trauma, will find that their Window of Tolerance is narrower. This means that it will take less stress or

perceived threat for them to be dysregulated into a hyper-aroused or hypo-aroused threat defense. If this is you, you might notice that you spend more time dysregulated than you spend regulated. The exciting news is that with daily practice of compassion or lovingkindness meditation, mindfulness meditation, and/or yoga, you can widen your Window of Tolerance so you can be open to experiences without becoming hyper- or hypo-aroused.

Your ability to self-regulate will improve over time and with continued practice. As you pay attention to your state of arousal, you will also notice more subtle signs of dysregulation. You might also be surprised to learn how often you are dysregulated.

Practices to Change Your Brain and Your Life

The practices listed below have been proven through neuroscience research to effectively help shift activation levels toward more optimal arousal. A variety of practices for self-regulation are offered and categorized into four different sections: breath practices, body practices, attention and awareness practices, and assisted self-regulation practices. These are all practices that I have found to be the most helpful for my clients. Experiment and be curious about how your nervous system responds with each experience. If done consistently, these practices will actually change your nervous system's tendency for dysregulation toward a more consistently regulated state, increase your ability to be within your window of tolerance, and activate your social engagement system. In essence, you train your brain to gain flexibility, resilience, range, and adaptability—to counter the automatic and rigid defensive responses of your survival wiring.

Breath Practices for Self-Regulation:

I. Slow Diaphragmatic Breathing (for hyperarousal)

Inhale slowly and deeply through your nose. Keep your shoulders relaxed. Place one hand on your belly and one hand on your chest. Your abdomen should expand and your chest should rise very little. As you're breathing imagine a balloon in your belly that gently inflates when you inhale and deflates as you exhale. Repeat this breathing exercise for three to five minutes. With practice, just taking one or two slow diaphragmatic breaths will help lower your arousal and move you back into your window of tolerance.

II. The Elongated Breath (for hyperarousal)

In this practice of deep, full breathing you will extend your out-breath so that it takes longer to exhale than to inhale. You can experiment with how long to lengthen your exhale. For example, you can inhale for five seconds and exhale for seven or eight seconds. Some people find that longer durations is more effective for them, such as the two-to-one breathing ratio. Here you lengthen your exhalations to be twice as long as your inhalations. Find what length of out-breath works best for you. If you practice this type of breath for two minutes, your heart rate will decrease, your muscles will begin to relax, and your blood pressure will decrease, shifting your nervous system into your Window of Tolerance.

III. Yogic Breathing Practices of Pranayama

These ancient practices were designed to influence and balance your nervous system response. For hyperarousal, choose breathing practices that foster a long, smooth exhale such

as The Cooling Breath (Sitali/Sitkari Pranayama). In this pranayama, the inhalation is moistened as it passes through the curl of the tongue (also described as an uncurling leaf or the beak of a bird) so that you are “drinking” water-saturated air.

How to Practice Sitali

- Sit in a comfortable position with the head, neck, and spine in alignment.
- Close your eyes, and breathe slowly and diaphragmatically for several minutes, then open the mouth and form the lips into an “O.”
- Curl the tongue lengthwise and let it protrude out of your mouth (about three-quarters of an inch or about two centimeters).
- Inhale deeply across the tongue and into the mouth as if drinking air through a straw.
- Focus your attention on the cooling sensation of the breath as the abdomen and lower ribs expand.
- Withdraw the tongue and close the mouth, exhaling completely through the nostrils.
- Continue doing sitali for two to three minutes, return to diaphragmatic breathing for several more, and repeat the cooling breath for two to three minutes longer. Gradually you can work your way up to a 10-minute practice.

Can't Curl Your Tongue? Try Sitkari

- Sit comfortably with your eyes closed.
- Gently press your lower and upper teeth together and separate your lips as much as you comfortably can, so your teeth are exposed to the air.
- Inhale slowly through the gaps in the teeth and focus on the hissing sound of the breath.
- Close the mouth and slowly exhale through the nose. Repeat up to 20 times. This practice is called sitkari.

Cautions for Sitali and Sitkari: If possible, it is best to practice with air that is close to body temperature or room temperature, since the breath won't be warmed by the nostrils—if the air is cold, it may aggravate the lungs.

For hypo-arousal—feeling shutdown or immobilized—try the Bellows Breath or Bellows Breathing (Bhastrika Pranayama). In the same way as a bellows draws in air and pushes it across glowing coals to create more heat, bhastrika uses the action of the abdominal muscles and diaphragm to draw air in and out of the lungs. This practice can increase your stamina, enthusiasm, and sense of well-being. This is a vigorous practice, requiring a series of active and forceful inhalations and exhalations.

- Start slowly—at the rate of 1 breath per second—and limit yourself to 3 rounds of 7 to 10 breaths, taking a series of relaxed breaths between rounds.
- When you can increase the speed without losing the force or evenness of your breath, gradually work up to 2 breaths per second and 120 breaths per round. As you do, your stamina, enthusiasm, and sense of well-being will increase.
- Sit in a steady, comfortable posture with the spine straight. Take a few deep, even diaphragmatic breaths, letting the abdomen expand as you inhale and collapse on the exhale.
- When you're ready to begin, exhale by contracting the abdominal muscles quickly and forcefully and follow it with a quick diaphragmatic inhalation, letting the abdominal

muscles relax completely.

- The challenge here is to coordinate the action of the diaphragm and abdominal muscles so the air moves in and out of the lungs quickly. As the abdominal muscles relax at the end of an exhalation, the diaphragm actively contracts to begin the inhalation; as the diaphragm begins to release its contraction after the peak of inhalation, the abdominal muscles immediately contract. It will take time and attention to coordinate these movements. Both the exhalation and inhalation will be audible, and the goal is to make them equal in both duration and force. Be patient, as this takes time and practice to become comfortable and proficient with the process.
- Cautions: It is best to practice this breathing technique on an empty stomach. Additionally, bhasrika (Bellows Breath) increases intra-abdominal pressure and may not be appropriate for women during menstruation or pregnancy, or for anyone with an ulcer, hiatal hernia, chronic constipation, heart disease, or high blood pressure.

IV. **Singing, Chanting, Toning** (for hyper- and hypo-arousal)

Using your voice and feeling your body resonate with the vibrations of sound naturally capitalizes on both an elongated out-breath for lower arousal, and the vibratory sensations in the body will shift your state and regulate your arousal. Singing in the shower or while in the car are just two examples of how you can easily fit in some regulation. What you sing, chant, or tone is actually less important because the active ingredient in all three practices is that you are elongating your out-breath. So, you can sing any song or any chant that you enjoy or find helpful.

V. **Blowing Bubbles** (for hyperarousal)

This is a fun way to help children or adults naturally elongate their breath.

VI. **Playing a Woodwind Instrument** (for hyperarousal)

Playing any instrument that is breath-powered will engage the relaxation response and lower arousal via the elongated out-breath that is required to play such instruments. Playing woodwind instruments integrates breath work with attending to rhythm—both of which help down regulate a hyper-aroused survival response.

VII. **Co-Breathing** (for hyperarousal)

In this practice, sit facing a safe partner. Place two chairs about three feet apart facing each other. Sit down and check that your posture is upright and comfortably supported, feet flat on the floor, hands resting in your lap. Gaze into each other's eyes and begin to breathe together. Ideally, you can use the elongated breathing practice together. Inhale and exhale in unison while maintaining eye contact. This practice combines co-regulation through breath practice while also activating the social engagement system by doing this with a partner. You can do this from just a few minutes or as long as you wish.

Body Practices for Self-regulation

I. **Touch and the Butterfly Hug** (for hyperarousal)

We humans respond to touch. Gentle, affectionate touch helps calm the nervous system and can trigger the release of oxytocin, the attachment hormone. Our bodies do not differentiate between when someone we love touches us and when we are touching or holding ourselves. The calming release of oxytocin occurs in both instances. So, when you are feeling upset,

ungrounded, agitated, or irritable, try giving yourself a hug or a gentle stroke on the cheek. See how that impacts the way you feel.

The Butterfly Hug is a great technique that was created and developed by Lucina Artigas during her work with the survivors of Hurricane Pauline in Acapulco, Mexico, in 1998 (Artigas, Jarero, Mauer, López Cano, and Alcalá, 2000). This technique was designed to be self-administered, and is based on Eye Movement Desensitization and Reprocessing (EMDR) and the idea that bilateral stimulation helps soothe and ground the nervous system, reducing the fight or flight activation. Here, Artigas describes how to do the Butterfly Hug:

“Cross your arms over your chest so that the tip of the middle finger from each hand is placed below the clavicle or the collarbone and the other fingers and hands cover the area that is located under the connection, between the collarbone and the shoulder and the collarbone and sternum or breastbone. Hands and fingers must be as vertical as possible so that the fingers point toward the neck and not toward the arms. Now interlock your thumbs to form the butterfly’s body and the extension of your other fingers outward will form the butterfly’s wings. Your eyes can be closed or partially closed, looking toward the tip of your nose. Next, you alternate the movement of your hands like the flapping wings of a butterfly. Let your hands move freely. You can breathe slowly and deeply (abdominal breathing) while you observe what is going through your mind and body—such as thoughts, images, sounds, odors, feelings, and physical sensation—without changing, pushing your thoughts away, or judging. You can pretend as though what you are observing is like clouds passing by.” (Artigas, Jarero, Mauer, López Cano, and Alcalá, 2000).

The Butterfly Hug is something you can do that combines the basic benefit of soothing yourself with the bilateral stimulation that helps reduce the charge of emotional or traumatic stress and hyperarousal. It’s like turbocharging a hug.

- II. **Hand Over Your Heart** (for hyperarousal and activating the social engagement system)
Rest the heel of your hand on your sternum around your heart area. Apply a steady, gentle, but firm pressure. For added effect, you can place your other hand across your forehead or on your abdomen. Experiment with the various placements and wait until you feel a shift. It may take up to 5 or 10 minutes of deep breathing in this position to shift if you are very activated.
- III. **Cold Water** (for hypo-arousal)
Splashing cold water on your face, behind your ears, and the back of your neck can help wake and energize yourself.
- IV. **Ice** (for hyper and hypo-activation)
Experiment with placing ice on your wrists, the back of your neck, and your forehead. See which placement helps you in each type of defensive arousal.
- V. **Mindful Walking** (for hyper- and hypo-arousal)
 1. First, stand in a comfortable, upright position.
 2. You can have your arms by your side or clasped comfortably behind your back.
 3. Take a few moments to drop into mindfully feeling your breath.
 4. Sense the rise and fall of your breath, breath by breath.

5. Then expand your awareness to include your body standing—feeling your feet on the ground, your weight being supported by your hips and legs, the sensations of this breath entering and exiting the body.
6. Relaxing and releasing any unnecessary tension in the body.
7. When ready, start slowly, as if you are walking under water.
8. While using your breath as an anchor, feel with your awareness the motion of lifting the foot, supporting your weight on the other leg as you move your foot forward, placing your foot, and then rolling on your foot as the other begins its journey forward.
9. Moving up close to the feeling of each leg moving and each foot alternately lifting, moving, placing, rolling . . . lifting, moving, placing, rolling.
10. Take your time. Walk slowly. The goal is not to get somewhere. It is to arrive fully in each step.
11. Each time your mind wanders, simply notice that it has and then gently return your attention to the flow of sensations of walking.
12. Once you can remain mindful of your walking and breathing, you can then further expand your awareness to include sights, smells, sounds, and textures.

VI. Dance (for hyper- and hypo-arousal)

Moving your body to music can be a fun and fast way to shift state and to reconnect with your body, rhythm, and expression.

VII. Yoga (mostly for hyperarousal, can be adapted for hypo-arousal)

Like dance, yoga invites you to reconnect with your body through movement. In yoga, you are adding the additional component of bringing mindful awareness to the movements and postures. Additionally, coordinating body movements and breath further potentiates its ability to shift your state.

VIII. Running (for hypo-arousal)

Although it's very challenging to move when you are in shutdown and under-aroused, once you begin running it can quickly shift you out of the shutdown state and re-energize you.

IX. Pressing Your Feet into the Floor or Holding a Textured Object and Noticing How It Feels in Your Hand (for hypo-arousal)

These two physical activities bring awareness to sensations of your body and objects, helping to shift you from the inner-absorbed, flat, and absent shutdown state to a more active and present non-defensive state.

X. Relaxation Techniques (for hyperarousal)

These include Progressive Muscle Relaxation (Jacobson, 1929), where you alternately tense and relax various muscles in a progressive sequence, or Autogenic Training (Shultz, 1969) where you mentally repeat certain phrases and imagine part of your body becoming warm and heavy—which has been found to be very powerful in reducing anxiety and tension. Here are instructions for Autogenic Training:

- First, sit or lie down in a comfortable position someplace where you won't be disturbed.
- Uncross your legs and relax your arms at your sides.
- Start with several elongated breaths as outlined above.
- Then say the following statements to yourself slowly.

- Repeat each statement three to six times silently to yourself.
- Visualize or imagine experiencing each sensation as you proceed.

1. My arms are heavy. My left arm is heavy. My right arm is heavy. Both of my arms are heavy.
2. My legs are heavy. My left leg is heavy. My right leg is heavy. Both of my legs are heavy.
3. My arms are warm. My left arm is warm. My right arm is warm. Both of my arms are warm.
4. My legs are warm. My left leg is warm. My right leg is warm. Both of my legs are warm.
5. My heartbeat is calm and regular.
6. My breathing is calm and regular.
7. My abdomen is warm and soft.
8. My forehead is cool.

When you are done, take a few deep breaths and slowly open your eyes.

Attention and Awareness Practices for Self-Regulation

I. Naming and Counting (for under-arousal)

In this practice, you open your eyes and move your head to look around the room, sweeping your vision here and there. In the process, you name each object, note its color, and how many of the object(s) you see. This facilitates shifting from the “disengaged” state by finding something to be interested in. For example, I will often ask a dissociated client to look around and describe to me the objects, books, lamps, et cetera, as well as the colors they see. This practice involves the client engaging their facial and head muscles for movement of their eyes to both scan and focus, verbalization to communicate what is seen, and some social engagement activation by inviting a safe exchange between client and therapist.

II. Notice and Name (for hyper- and hypo-arousal)

This was developed by Deb Dana, LCSW (2018), who also calls this “Becoming an Expert State Detector.” You first begin with tuning into the state of your autonomic nervous system by noticing your thoughts, feelings, and body sensations. This brings the current state of your nervous system to conscious awareness. The next step is naming what you notice. Where are you on the autonomic map? Name the state. Are you in fight-or-flight or in shutdown? Or are you in your Window of Tolerance? Then you bring curiosity (being curious re-engages your thinking and socially engaged brain) to ask, “What is there to learn from your autonomic nervous system in this moment?”

III. Compassion or Lovingkindness Practice (for hyperarousal)

Cultivating compassion for self and others is a powerful way to shift state and to build resilience, which widens your Window of Tolerance. Regular practice nurtures and nourishes your ability to meet the people, events, emotions, and moments of your life in a self-regulated way. Additionally, practicing compassion activates the social engagement system and may also support the tend-and-befriend response.

IV. Mindfulness (for hyperarousal; also to enhance your ability to both notice your autonomic state and to shift your state into your window of tolerance)

The practice of mindfulness meditation is well documented to reduce stress, enhance your ability to cope with illness, reduce intensity of perceived pain, decrease depression and anxiety, increase a sense of calmness, improve cognition, decrease distractibility, and increase your sense of well-being. Practicing mindfulness is a powerful road to improved self-regulation. Additionally, this type of practice builds the ability to notice when you have become hijacked by your thoughts, daydreams, fears, projections, and neuroception.

Mindfulness of Breath

1. If you wish, you can begin by taking a few moments and several conscious breaths to relax as outlined in the relaxation techniques listed above.
2. Then tune your awareness to the sensation of your breathing . . . feeling the moment-by-moment changing sensations of the full duration of your in-breath . . . and sensing the flow of sensations of the full duration of your out-breath . . .
3. No need to change or control your breath. Simply allowing your breath to find its rhythm.
4. Just riding the waves of your breath . . . breath by breath . . . remaining aware of the ever-changing sensations of the breath.
5. Giving yourself permission to let go of a need to do, or to fix, or to problem-solve . . .
6. When you notice that your attention has wandered off the breath and into a thought, daydream, or memory, simply note that it has wandered and—like training a puppy on a leash—gently and without judgment return your attention to your breath.
7. By paying mindful attention to breathing, breath by breath you are creating the conditions where your nervous system most easily self-regulates.

Within meditation disciplines there are two types of practice: formal practice and informal practice. Formal practice is when you intentionally set aside time from the rush of doing and busyness to practice mindfulness. A daily formal practice is recommended so that you can develop the ability to be more deeply present and mindful.

Informal practice is when you happen to engage in a practice—say, mindfulness of breath—while you are sitting at a traffic light or washing the dishes. This involves shifting your attention from being absorbed in your thoughts to sensing the movement of your breath, your posture, sounds, sights, and smells. You notice without the constant commentary, slowing down to more fully attend to this moment. This is the process of returning to presence or mindfulness. Certainly, this can be incorporated into your work day as well. For example, while at work or engaged in tasks, shift some of your attention to include the sensations of the movement of your body breathing.

Assisted Self-Regulation Training

In addition to the types of practices above that you can do on your own, there are additional methods that involve either working with a mental health professional or obtaining some equipment that provides feedback about the state of your physiology.

- I. **Heartmath** (for hyperarousal and activating the social engagement system)
This is centered around generating heartfelt feelings of gratitude and appreciation that help you shift state and to activate the social engagement system. This is a biofeedback-assisted training that will help you learn this potent skill within several sessions.
- II. **Neurofeedback** (for hyperarousal)
This is biofeedback of your brain waves. Neurofeedback trains your brain to shift into self-regulation, reducing your reactivity to triggers and helping you identify states that support self-regulation (and those that do not). Neurofeedback effectively reduces fight-or-flight activation and teaches you how to shift your state of arousal.
- III. **Eye Movement Desensitization and Reprocessing (EMDR)** (for hyperarousal)
This is a brain-based method that was developed to reduce the cognitive rumination and the fight-or-flight activation that is part of hyperarousal. It is an effective and powerful way to lower reactivity and arousal.
- IV. **Somatic Psychotherapy** (for hyper and hypo-arousal)
Somatic or body-based psychotherapies integrate the latest findings in neuroscience with a therapeutic approach that is designed to increase self-regulation while also transforming core beliefs, which can keep the cycle of activation going.
- V. **Hypnotically Enhanced Guided Imagery** (for hyperarousal and for some states of hypo-arousal)
Hypnosis can be used for self-regulation and activation of the social engagement system through use of specific relational imagery for Protection and Connection. It can both help you self-regulate, and activate the social engagement system.

Integrating Theory and Practice in Your Daily Life

“If you can change your mind, you can change your life.”

—William James

Nervous system dysregulation will keep you from feeling connected, happy, or at ease. Whenever your neuroception detects danger, your survival responses roar into activation. Being in either fight, flight, or shutdown/immobilization responses increases feelings of disconnection, unhappiness, and stress. Polyvagal Theory offers a map to understand the different types of survival responses you have, as well as the physiological and psychological states of each.

In contrast to the other two survival responses, the social engagement system—the most recently acquired response—is also the state that will promote connection, happiness, and ease. Anytime you can self-regulate to activate the social engagement system, you are optimizing your chances to feel calm, relaxed, connected, and happy.

It is also helpful to think of your window of tolerance and ask yourself where you are on the map of your nervous system. This can alert you to engage in an appropriate practice to return your arousal level back into your window of tolerance. With practice, you will be able to notice sooner when you beginning to move into defensive activation (fight, flight, or shutdown). Using the above practices, you can shift your arousal into the window of tolerance before you “flip your lid.”

The promise of a brain-based perspective is that you can truly change the way that your nervous system reacts and how you respond to states of fight, flight, or shutdown. Rather than being driven and limited by activation of older survival responses, you can befriend and shift your nervous system to more optimal states.

However, these are skills that are developed and strengthened over time, not overnight. Please be patient and kind with yourself. With regular practice, you will be able to shift out of the defensive states. Be aware that if you scold or judge yourself for how well you are doing this, you will just be further activating fight-or-flight, becoming even more dysregulated.

By learning to self-regulate and by choosing to activate your social engagement system, you are creating the best foundation for enhancing connection with self and others, lasting happiness, and fostering a sense of calm and ease.

References

Artigas, Lucina, Ignacio Jarero, Magali Mauer, Teresa López Cano, and Nicté Alcalá. “EMDR and Traumatic Stress After Natural Disasters: Integrative Treatment Protocol and the Butterfly Hug.” Poster presented at the EMDRIA Conference, Toronto, Ontario, Canada, September 2000.

Dana, Deb. *The Polyvagal Theory in Therapy: Engaging the Rhythm of Regulation*. New York: W. W. Norton & Company, 2018.

Drubach, Daniel (2000) *The Brain Explained*. Prentice-Hall, New Jersey.

Jacobson, Edmund. “Progressive Relaxation,” *University of Chicago Monographs in Medicine*, second edition. Chicago, IL, 1938.

Porges, Stephen W. “Orienting in a defensive world: Mammalian modifications of our evolutionary heritage: A Polyvagal Theory.” *Psychophysiology* 32:301–318. 1995.

Porges, Stephen W. “Connectedness as a Biological Imperative: Understanding trauma through the lens of Polyvagal Theory.” Interview for *The Healing Trauma Summit*. Louisville, CO: Sounds True. 2018.

Schultz, J.H., and W. Luthe. *Autogenic Methods Autogenic Therapy*, Vol. I. New York: Grune & Stratton. 1969.

Siegel, Dan. *Mindsight: The New Science of Personal Transformation*. New York: Bantam Books, 2010

Taylor, S., L. Klein, B. Lewis, T. Gruenwald, R. Gurung, and J. Updegraff. "Biobehavioral Responses to Stress in Females: Tend-and-Befriend, Not Fight-or-Flight." *Psychological Review*, Vol. 107, No. 3, 411–429. 2000.