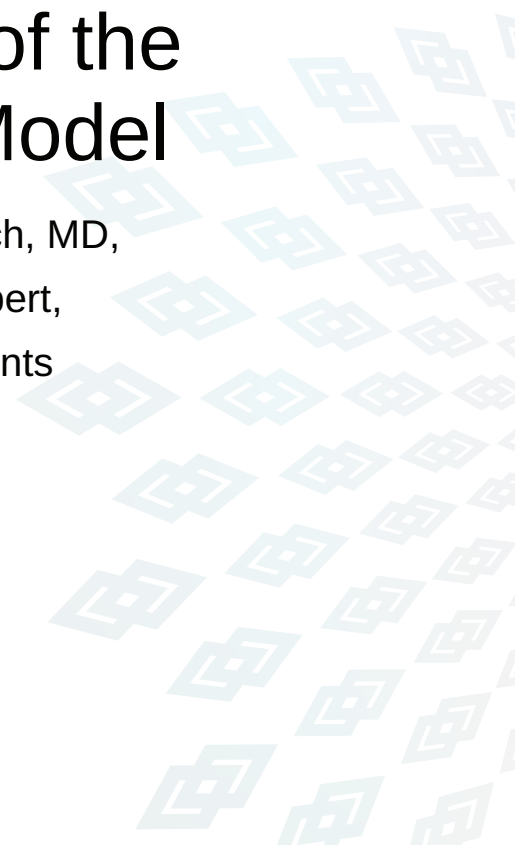


Neuroscience, Coaching, and the Relevance of the Co-Active Model

By Dr. Carlos Davidovich, MD,
Neuromanagement Expert,
Executive Coach Contents



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Introduction and Scope of Work

The purpose of this document is to offer coaches the scientific support that will help them understand the impact of the CTI approach they have been using successfully. The latest evidence from neuroscience helps explain why what you're doing might or might not work. For this purpose, this article connects the dots between the CTI model and neuroscience.

Many practices throughout history have proven to be effective long before understanding why. The same is true with the CTI coaching model. Years of applying the model and seeing tangible results are a testament to the effectiveness of the approach and the skills used. However, a deeper comprehension of what is happening in the brain during coaching can make the model even more effective and help us explain to clients the impact of the coaching process on their brains. You'll find that clients will be more receptive to working with you in ways they're not used to and will understand why we take time on the steps involved like embodying a new emotion and visioning.



PART 1

Neuroscience and Coaching



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The latest findings in neuroscience shed light on how the coaching process impacts the brain and why it's so effective. Over the following pages, you will see that humans are comprised of a complex array of physical and energetic parts that work together as a whole. If we leave any part out, we miss a vital piece of the puzzle. We'll start by identifying the individual parts and then connect the dots to understand how we function as a whole.

Neuroplasticity

There are two key concepts we need to explore that we can introduce through two quotes, one related to neuroplasticity and the other to emotions. The first quote is from Santiago Ramon y Cajal who won the Nobel Prize in Medicine in 1906:



“Every human being, if they want to, can be a sculptor of their own brain.”

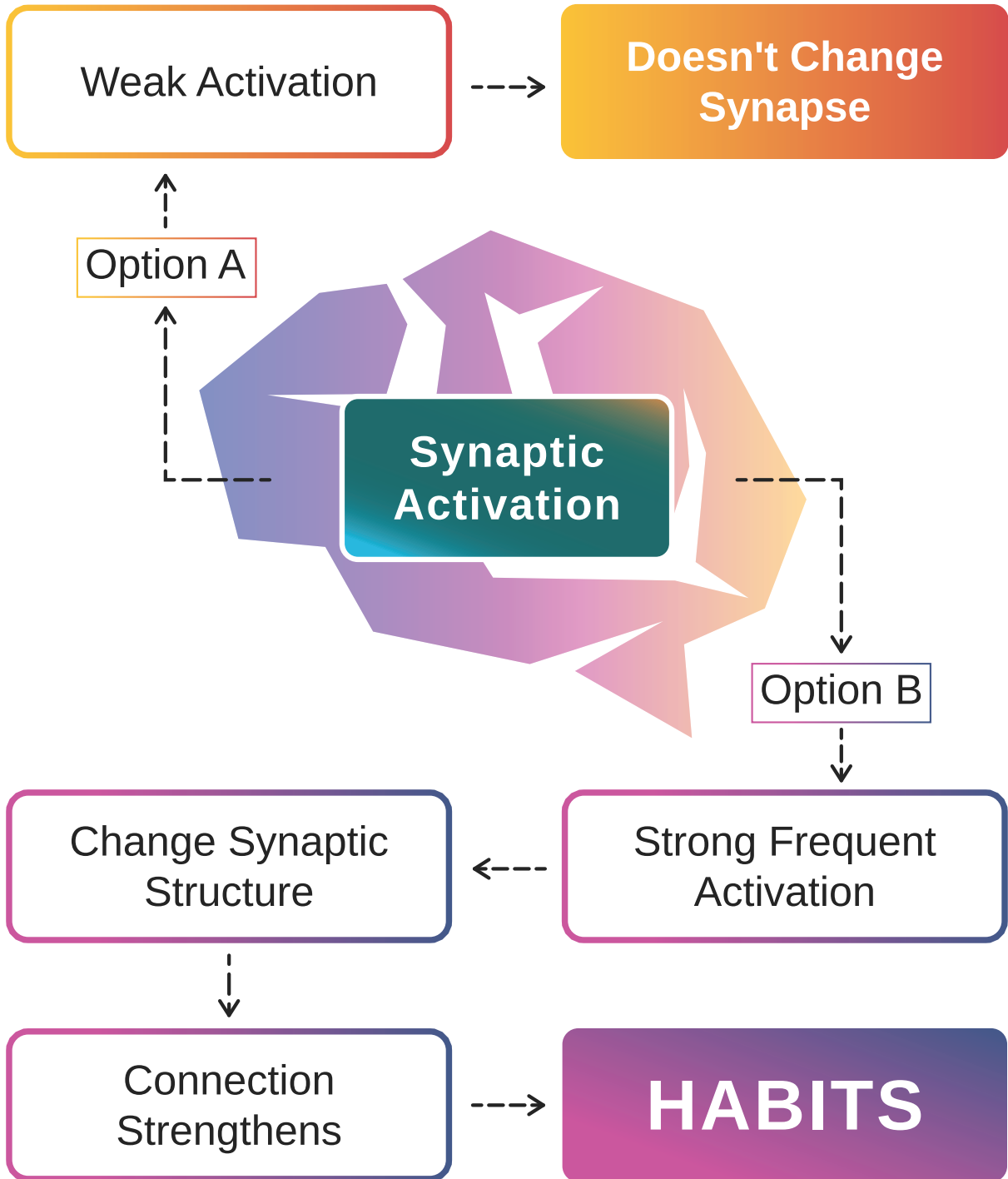
This phrase is perhaps the most representative of the concept of neuroplasticity. The idea in relation to behavior was first mentioned by William James (1842–1910), although it wasn't until the 1970s that we came up with the science to back it up. Neuroplasticity literally means “a moldable brain.” This term was originally introduced by an Italian psychiatrist Dr. Ernest Lugaro in 1906.

Neuroplasticity, also known as neural plasticity or brain plasticity, is the ability of neural networks in the brain to change through growth and reorganization (Costandi, 2016). In other words, the brain adapts when we learn or experience something new or undertake a new physical activity. This capacity of the brain is active during our whole life. Nevertheless, for a new pathway to be forged, we need to have the new experience on a continued basis. In other words, repeated experiences cement the new learning.

Neuroplasticity involves a “fire together, wire together” principle. If certain neurons keep firing at the same time, eventually they'll develop a physical connection, establishing a new “road” or pathway in our brain.

Neuroplasticity

Ability for the brain to rewire



Just like we can generate new pathways, we also have the power to remove or modify old ones. Changing a behavior requires removing or deleting old pathways and building new ones.

While it's not certain how long it takes to create a new pathway or to eliminate an old one, traditional belief based on the work of Dr. Maxwell Maltz suggests it takes three to six weeks of practice. Dr. Susan Riech talks about 10,000 repetitions that can take three months. And James Clear in his best-selling book, *Atomic Habits*, refers to the 21/90 rule: it takes 21 days to make a habit and 90 days to make it a permanent lifestyle change (Clear 2019).

Despite their differences, these philosophies agree that we can influence and lead our development by creating new neural pathways. This implies a huge opportunity, but it also comes with great responsibility. Unless we have encountered trauma, for example, we can't blame anyone but ourselves for our behavior.

This personal responsibility attests to the benefits of a coaching practice. We now have evidence to say that coaching is a highly effective way to leverage neuroplasticity capabilities, build new neural pathways, and change behavior permanently.

The question therefore shouldn't be "Can I change?" but "Am I willing to change?"

Emotions: Their Key Role

The second quote we need to understand is commonly attributed to Dr. Antonio Damasio, Professor of Psychology, Philosophy, and Neurology at the University of Southern California:



“We are not rational beings that feel, but emotional beings that think.”

The human brain is not designed to make 100% rational decisions. In every decision-making process, although the whole brain system is involved, the final decision (whether consciously or subconsciously) lies in our emotions. Interestingly, the words emotion and motivation share the same Latin root, *movere*, which means “to move” or “to take action.”

Dr. Damasio's research led to the understanding that the switch to decide to act is physically located in our emotional brain. As he explains, "Emotions are not a luxury, they are essential to rational thinking and to normal social behavior."

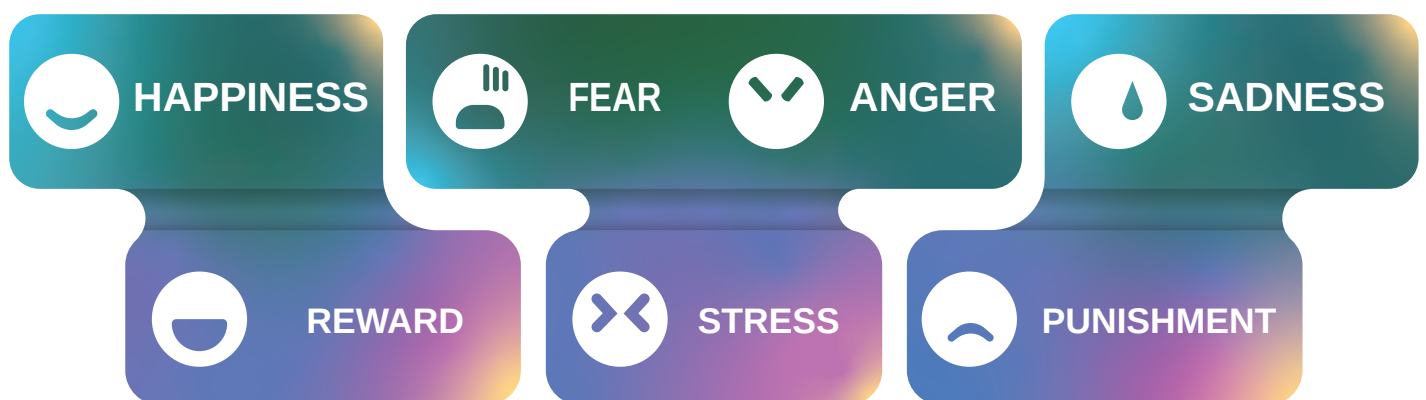
A quote by neurologist Dr. Donald Calne expands on the idea: "The essential difference between emotion and reason is that emotions lead to actions, while reason leads to conclusions." Emotion and reason are very much connected, but final decisions are triggered by emotions.

This is an important distinction to know for effective coaching. Defining which emotion is behind a behavior or action is the gateway to understanding what's happening at any given moment and key to unlocking desired change. Generating change is much less likely if we're not associating the behavior with a specific emotion.

Psychiatrist Carl Jung would agree. He said, "There can be no transforming ... of apathy into movement without emotion." Philosopher Baruch Spinoza said something similar more than 350 years ago: "Reason cannot defeat emotion; an emotion can only be displaced or overcome by a stronger emotion."

Without needing to become experts in emotions, we can start by helping our clients identify the universal basic emotions and their three main effects: reward (happiness), punishment (sadness), and stress (fear and anger) (Simeng Gu, 2019).

The Four Basic Emotions and The Three Effects



Our job as coaches is to interpret the signals our clients give us to help them understand their emotions.



Our Internal Operational Systems

As has been proven, both neuroplasticity and emotions play a central role in one's ability to change through coaching. Keep these two matters in mind as we dive into the three key systems that determine how we operate:

1. Our Internal Team

Our brains relate to human behavior through different modes of expression or manifestation, which we will refer to as our “internal team.” Each comes from a different part of our brains and has very specific narratives. We will explain how they interact with each other and the consequences of each one being “in charge.”

2. Neural Networks

The brain's neural network is a complex system of billions of interconnected neurons. The strength and organization of these connections determine our thoughts, emotions, and behaviors. We need to understand the concept of neural networks and how different pathways are forged in our brains and lead to different behaviors.

3. Somatic Intelligence

Somatic intelligence focuses mainly on the autonomic nervous system, which connects the brain with the rest of the body through our stress and relaxation responses. This system is the key component to understanding the impact of any embodiment intervention — a therapeutic technique that helps individuals become more aware of their bodily sensations, emotions, and behaviors.

Our Internal Team: The Key Players in Our Internal Team and Their Narratives

The Human Brain: Summary of Research & Theories

The latest understanding of how the brain works is explained through the concept of the so-called “adaptive brain.” We now know that the brain works as a whole; every physical part is connected and needs the other parts to function properly.

Even though McLean’s model of the triune brain (McLean, 1960) is now old and debunked (Striedter, 2006), the model still aids our understanding. He described an evolutionary model of the brain, starting with:

The reptilian brain (reptilian complex in the basal ganglia) is mainly associated with our survival reaction and basic functions. Its existence can be dated back 500 million years.

The limbic (emotional) system, also referred to as the paleomammalian complex, is a set of brain structures located on both sides of the thalamus, immediately beneath the medial temporal lobe of the cerebrum primarily in the forebrain. It has a variety of functions including emotion, behavior, long-term memory, and olfaction and has existed for around 200 million years.

The prefrontal cortex (neopallium, isocortex, or the six-layered cortex) is a set of layers of the mammalian cerebral cortex involved in higher-order brain functions, such as sensory perception, cognition, generation of motor commands, spatial reasoning, and language. This rational part of our brain, as we understand it today, has been around for 100 thousand years.

Today we talk about a total integration of all these parts in our brain. We will explain it later as different neural pathways.

To aid our understanding of what works to facilitate change, we take the characteristics of these three areas of our brain and consider that they provide us with three different “narratives”:

A rational narrative

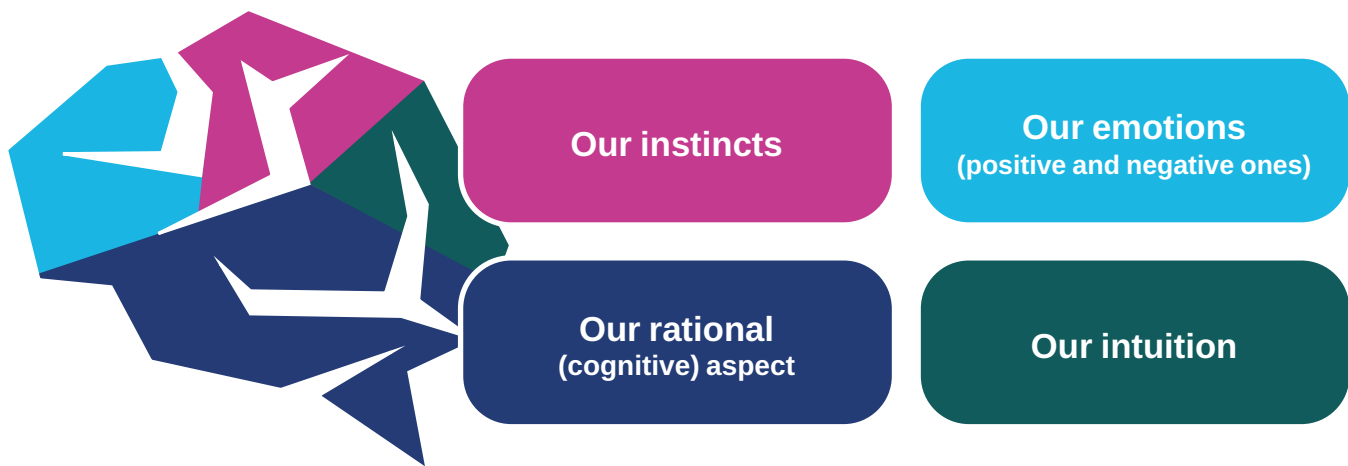
An instinctual narrative

An emotional narrative

We also need to add one more fundamental narrative we refer to as “intuition.”

Each of these narratives — each part of our whole brain — has a completely different way of seeing and understanding the world around us. You could say they have different job descriptions, speak different languages, and take care of different parts of ourselves. Depending on which one is leading the decision-making, we can approach situations in completely different ways, which can result in different outcomes. As coaches, we must understand and identify the specific narratives coming from both our clients and ourselves.

Most people recognize these different narratives or internal voices instinctively. They make up our internal team — or internal “dialogue” (from a neuroscientific perspective):



We will briefly explain each one.

1. Instinctual or Reptilian Reaction

As mentioned previously, one member of our internal team “speaks” to us and produces very specific results or consequences: our instincts. When we’re led by our instincts, the following characteristics apply:

- It’s all about survival — the fight, flight, freeze, or flock response.
- It’s a zero-sum game. We only go for win-or-lose situations.
- It’s contagious. Instinctual energy awakens similar reactions in others.



- When our instinctual narrative is activated, our rational narrative or rational brain is deactivated. They cannot be in charge or activated at the same time.
- Due to being the oldest narrative and the one in charge of survival, instinct is our typical default as the voice we trust most.

It's so primitive, in fact, that most of the time we are not fully aware of how powerful and active our instincts are at any given time. The reptilian narrative is so clever that it knows perfectly well how to hijack the other narratives (our other brain parts) and make them work for their own aims.

2. Emotional Narratives

Scientists have confirmed recently that we have neurons in our heart (Armour, 1991) and gut (Gershon, 1999). We can now say that our emotional narratives come from different parts of our brains and that our heart and gut “brains” are always involved in our emotional reactions or responses.

Although there are many ways to classify emotions (P. Ekman, 1970, 1992, 1999, 2011), a helpful definition is that “Emotions are an integral part of our everyday lives and our social interactions. An ability to recognize emotions in the faces of others is essential in order to understand these emotional facets of interaction with others.” (Ekman, Cordaro, 2011).

Each emotion bears an important message, providing the information we need to support our clients. Lasting change in our brain only happens when we can connect an action with a specific emotion – a connection we can help our clients make.

3. The Rational Narrative

For most of our clients, the rational understanding of any problem is the path to solving it. Some people feel more comfortable when they understand the situation from a rational perspective; it helps them feel safe. It's easier to introduce the concept of the different narratives once we've explained rationally how they function.

We shouldn't diminish the importance and power of our rationality, however, it's not the strongest member of our internal team. Instincts and emotions are true professionals in hijacking our rational members for their own objectives. The question then becomes: What is the best way to get the most out of our rational part?



The most successful approach is to generate positive emotions that open the door to our most helpful rational narrative. For example, focusing on solutions, not problems, is one of the best ways to access our highest rational functioning. We need to guide our clients away from focusing on past negative experiences or emotions and encourage their rational narrative to be the doorway to connecting with the right emotions. Then will they reach a real understanding of the situation and, as a result, start to change.

4. Non-conscious Intelligence

The fourth member of our internal team provides us with the narrative coming from what we call “intuition,” also known as our non-conscious intelligence (Kaufman, 2011; Lara-Rosano, 2017; Lachman, 1979). Intuition is one of the most powerful sources of information, though it’s often difficult for most of us to understand or decode its knowledge.

Intuition is often criticized by our rational internal team members. The rational narrative only believes in the story when it can clearly identify and rationally explain the process involved. Intuition, however, works differently; it’s a source of information that arises from different parts of our brain coming together in a unique way.

Where does intuition come from? One key component seems to be our gut brain. When we say we have a “gut feeling,” it’s not just a popular expression. It has a rational explanation.

Psychologist Gerd Gigerenzer said: “Reflection and reason are overrated. Much better qualified to help us make decisions is the cognitive, emotional, and social repertoire we call intuition, a suite of gut feelings that have evolved over the millennia specifically for making decisions.” Antonio Damasio describes the ventromedial prefrontal cortex as the part that triggers the nonconscious emotional responses that normal people register as intuition or a “hunch” (JP Changeux, 2005). Scholar and author Bob Samples mentions a phrase (mistakenly attributed to Albert Einstein yet helpful nonetheless): “The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honors the servant and has forgotten the gift.”

Using the analogy of information technology, think of it as an algorithm — a complex, nonconscious process that takes place behind the scenes. It’s a process, as mentioned by Damasio, that connects all the information, emotions, and experiences stored in our brains and then comes up with a response. The more experienced we are, the more information we have and the better our “algorithm” works.

Some people have a greater capacity than others to listen to and understand their intuition. The good news is that we can train intuition. The more experiences we have that are connected with emotions, the more we feed and shape our intuitive responses. Our emotional experience serves as the crucible through which intuition is forged (JJ Kennedy, 2024).

Another factor that helps our intuition work better is a strong connection with our clients. A potential downside, however, is that our intuition is only helpful when not hindered by our natural biases.

Our internal narratives greatly affect our interactions. This breakdown should illuminate how important it is to recognize the narratives of our different internal team members, in our clients and in ourselves as coaches. Identifying which voice is talking or “calling the shots” allows us to:

- Target the root motivation or intention behind our current behavior or decision-making
- Decide if that driver is helping or hindering the situation

Assessing these implications equips us to better support our clients. With insight, we might challenge our clients to consider whether a different member of their internal team should take charge.

Self-Management

Now that we know more about our internal team and how the different parts of our brain interact, we need to think about who we want to be in charge. Which voice should be leading?

The leading tool we have to direct our internal team properly is a human brain capacity called metacognition, or “thinking about thinking.” It’s the capacity to observe ourselves from the outside and be aware of our thought processes. Widely used in psychology, metacognition is an effective way to identify different expressions of ourselves.

It likely sounds unusual because it’s so different from typical communication. But it’s helpful to know the difference between “I am angry” and “a part of me is angry.” Once we’re conscious of this distinction, we can then feel more in control and consciously decide the appropriate course of action.

At the beginning of every coaching session, we need to be in a metacognitive state — that is, observing ourselves. This self-observation leads to proper self-management.

How do we make sure we’re in the right state? You can create your own ritual to check in with yourself before you start each coaching session. We find a useful example in drivers and pilots. Before starting a journey, they check the dashboard to confirm that everything is under control. It’s important for us to practice a similar assessment — to take our time at the beginning of a coaching session to check where we are, ask how we feel, and discern what emotion is present or dominant at that moment. What is your state of mind? Which of your internal team members is in charge? This check-in allows you to understand how open you are for the session, how prepared you are to listen, and how effective and helpful you will be for your client. If the wrong member is in charge, you need to know how to activate your whole self for the session.

The human brain is subjective by default and full of biases. Metacognition is a state that enables better self-awareness in a given moment.





Our Neural Networks

Our Adaptive Brain Model

Knowing about our internal team, how does the brain organize itself so that these characters can express themselves? The answer is in the adaptive brain model, which explains how the different parts of our brain interact, activate, and connect with each other.

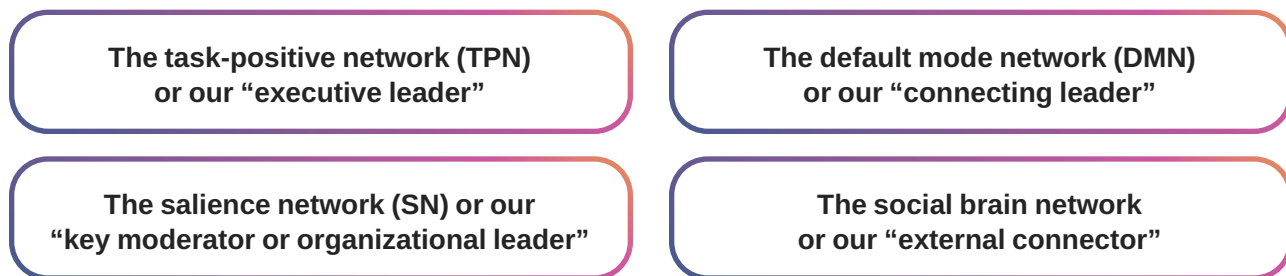
This model illustrates that everything is connected and intertwined and our brains can only work when integrated as a whole. As mentioned before, emotions are not only located in one place, nor are any circuits in the brain purely emotional. It shouldn't be surprising, then, that the cortex is not just a cognitive center nor are only cognitive circuits in the frontal cortex.

Brain Highways or Neural Networks

The adaptive brain model is based on the concept of “highways” that are distributed throughout our brain, which are technically called interconnected neural networks (McCulloch WS, Pitts W, 1943). A neural network is a population of biological neurons chemically connected to each other. The neurons' purpose is to optimize the body's internal state, communicating between emotions and cognition so a person can adapt to continuously changing needs.

Another way to explain this process is that these highways are the means of expression of our different internal voices. The voices can only express themselves if they travel along specific highways. In our coaching work, we aim to interact with our clients through these highways, modulating their activation to determine if the right ones are being used.

The human brain has several clearly identified networks or highways. For our coaching work, the four most important networks are:



The following chart displays the key characteristics of the first two:

Task-Positive Network (TPN)	Default-Mode Network (DMN)
Focusing on a task	Dreaming
Actively paying attention (to something internal)	Envisioning the future
Goal orientation	Theory of mind (working with others)
Reacting to, and working with, sensory information	Gauging others' perspectives
Short-term (working) memory	Long-term memory
Planning	Introspection
Abstract reasoning	Self-referential thought
Concentrated in the rational brain	The DMN is widely dispersed throughout the brain

The TPN is more connected to our rational system — the capacity to focus and arrive at conclusions. Our rational narrative expresses itself through this highway as the main thoroughfare of our analytical thinking.

The DMN, on the other hand, is more connected to our emotional and intuitive systems. When we are daydreaming or mind-wandering, we are immersed in our DMN highway. The brain is expected to engage in DMN-related functions such as remembering the past, imagining the future, thinking about others, and displacing the self in imaginary situations. The latest research shows that DMN could be divided into multiple subsystems supporting different functions. By now, it is well known that the DMN is not only deactivated by tasks but also involved in affective, mnemonic, and social paradigms, among others (Mancuso, 2022).

Activating Your Client's DMN

The DMN highway is also the source of insights or “aha moments” and the one we can activate to help our clients find their own information and solutions. How do you raise your client's awareness and help them become present?



Once the initial rational analysis and objectives of the coaching process have been defined, we should shift our client's focus away from rational thinking of the TPN pathway. We activate the DMN by applying techniques that mitigate our clients from doing any kind of rational analysis, such as breathing, mindfulness, or relaxation techniques. Ask your client to focus on their body's sensations or any process that involves imagination, images, metaphors, analogies, reframing, or humor (Sambuco N., 2022).

We can also help our clients daydream and induce a mind-wandering state. Most of our clients will try to keep the TPN activated and their rational narrative in control because it represents their comfort zone or their safe space. Helping them tap into their best inner resources instead is a unique benefit of coaching.

For many of us, emotions, intuition, and instincts are uncharted territory and represent areas that trigger fears. In many situations, the most effective way to guide our clients from the TPN to the DMN is by explaining the reasons and purpose of those fears. Then we can calm down the gatekeeper that keeps their rational side active and protects their feeling of being in control.

Let's look at another practical example of the interaction between these two key neural pathways.

Empathy & Analytical Thinking

Empathy and analytical thinking are two types of brain activities that cannot be activated at the same time. Empathy works through the DMN while analytical thinking works through the TPN.

In coaching our clients, we need to be empathetic. But if we keep the whole session in empathetic mode, we are not able to do any proper analytical thinking, which is required to determine the best approach or technique to use with them.

We must strike the right balance between empathy and analysis to support our clients adequately, learning how and when to shift from one to the other. In other words, we must self-manage and move from our DMN to our TPN at the right time (Jack, 2012). Attempting to activate both at the same time would be to the detriment of each of them (French, S. E., & Jack, A. I. 2014).



Every human being has a tendency based on their personality style (mainly defined by their DNA) to be more analytical or empathetic. It's helpful in your coaching practice to understand your and your client's tendencies because it shapes how we talk, perceive, and understand situations. We need to be able to recognize each client's tendency so we can help them move from one to the other, broaden their perspective, and increase the odds of them finding a good solution.

Once our clients are open to activating their DMN, our work as coaches is to try to facilitate their process to activate insights.

Facilitating Insights in Our Clients

We can uncover the right solutions for clients by understanding their unique minds. What brain areas are activated in moments of insight?

Deliberate creativity that results from analysis is primarily controlled by the prefrontal cortex. This is called “convergent thinking.” On the other hand, creativity that comes as a sudden flash of insight involves three brain regions: the temporal, occipital, and parietal. This is called “divergent thinking.”



What Is Insight in the Brain?

Insight is defined as the brief moment when previously unrelated ideas come together to create new understanding. It occurs when a person suddenly reinterprets a stimulus, situation, or event to produce a nonobvious, nondominant interpretation. This can take the form of a solution to a problem (an “aha” moment), comprehension of a joke or metaphor, or recognition of an ambiguous perception.

Insight is useful for finding new and more useful solutions, which rarely happens when we have a hard focus on something. As a coach, we can help our clients get out of the hard focus of the TPN, which blocks out seemingly unrelated ideas, to create an atmosphere that is more conducive to insights.

Recent results on the neural underpinnings of insight have led researchers to propose a neural framework referred to as the “insightful brain” (Shen, 2012). This framework represents the neural basis of the cognitive and affective processes involved in insight. While insight occurs in DMN territory, it affects many areas of the brain, including the lateral prefrontal cortex, cingulate cortex, hippocampus, superior temporal gyrus, fusiform gyrus, precuneus, cuneus, insula, and cerebellum.

Another noteworthy fact related to insights is that people tend to have more creative illumination when in a happy, relaxed mood. As you may have already observed, those states keep us out of our TPN fixation.

Just as intuition works better with more experiences, creative insights spring from a source. The generation of new ideas or insights rarely happens at the office or when we rationally want them to. New connections between concepts are born of a rich knowledge base.

Technically, studies of the brain during creative insights show a burst of high-frequency oscillations over the right superior temporal gyrus of the brain. Practically, there are ways to induce or train our brains to glean insights in the right circumstances (Kounios, 2018). In a funny way, there is a common saying that creative insights follow the rule of the 4 Bs. They can mainly be achieved when we are in one of the following situations: “Bath, bus, bicycling, and bed” (sleeping on it).

While we sleep, our brain mostly shuts off the rational brain while the rest remains very active. The DMN activates and can creatively connect all the information we have. Think of it this way: insights cannot be forced, only invited.

The Salience Network (SN): Our Key Moderator

The salience network’s main function is to determine and organize the TPN and DMN and to know when to best activate either one. It decides which one should be in control based on what is happening and hopefully avoids missing important information or mixed messages. The SN plays less of a role in conducting the tasks themselves and more in moderating control of internal and external processing.

The SN constantly monitors the external world and carefully scans how other brain networks react to new information and stimuli. This “moderator” decides how much the human body receives signals involving emotional response, processing reward, motivation, emotion, and pain.

The SN also regulates and transitions between networks swiftly and imperceptibly to address the changing demands of the moment. Physical damage to the salience network can impact actions, as well as perception of pain and moral reasoning (Schimmelpfennig, 2023).

Aside from this important moderating function, the neural network or highway is mainly connected with our emotions. It reacts to rewards and pain; pleasure attracts, pain repels. The SN senses this all the time and responds.

We can help our clients move from pain to pleasure by identifying the emotions that are present. Some feelings will need analytical thinking, so we need to help our clients activate the TPN when needed while other emotions will require activating their DMN to elicit appropriate responses.



Helping our clients identify their emotions at the beginning of a conversation provides the SN with information and serves as a signpost to determine whether activating the TPN or the DMN will be more supportive.

The Social Brain Network

The social brain network that supports our intrinsic need for connection works across multiple regions throughout the brain to support complex social interactions. The right temporoparietal junction, for instance, allows you to think about another person's mental state, whereas the amygdala is key in being able to interpret emotional facial expressions and process fear. Recent studies have even found that individuals with bigger amygdala volumes had larger and more complex social networks (Bickart K, 2011).

One interesting finding is that we are not born with this network; we build it throughout our lives. The influence of the environment (epigenetics) and our capacity to deal with it makes a huge difference (Anila D'Mello, 2019).

In our coaching practice, understanding this neural network helps us identify whether strengthening might be beneficial for our client.

Somatic Intelligence

In her book *Your Body Is Your Brain*, Amanda Blake defined somatic intelligence as “the ability to discern subtle nuances between different bodily states, moods, and thought patterns and to respond effectively to those nuances.” Her concept of somatic intelligence centers on the idea that our bodies possess deep, intrinsic wisdom that can guide our thoughts, actions, and emotions. She understands that this is the underpinning of both social and emotional intelligence. By cultivating somatic intelligence, individuals can achieve a greater sense of balance, presence, and effectiveness in their personal and professional lives (Blake, 2018).

The main player that facilitates this is the parasympathetic nerve or vagus nerve (VN), a part of the autonomic nerve system (ANS). The ANS plays a crucial role in the maintenance of homeostasis, a self-regulating process by which biological systems maintain stability while adjusting to changing external conditions (Billman, 2020). The ANS is compounded by two specific systems: the sympathetic and the parasympathetic one.

The sympathetic system controls “fight or flight” responses and prepares the body for strenuous physical activity. The parasympathetic system regulates “rest and digest” functions.

Eighty percent of the information we receive goes from our body to our brain. That’s why our body is our main source of processing information and supports us in our decision-making processes (Blake, 2018). Because our parasympathetic system is our “antidote” to stress in our whole body, any effective embodiment technique works by activating this system.

80%

of the information
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The parasympathetic nervous system affects the same body functions as the sympathetic nervous system but in a completely different way. It slows down certain responses and brings about a state of calm to the body, allowing it to rest, relax, and repair itself. The primary function of the parasympathetic nervous system is to maintain long-term health and a healthy balance across all the body's functions. It builds energy (Fritz, 2008) and conserves energy to be used later (Tindle, 2022).

Positive emotions result in altered autonomic nervous system activity, characterized by increased parasympathetic nervous system activity. Negative emotions (e.g., anger) result in parasympathetic withdrawal and sympathetic activity (McCraty, Atkinson, Tiller, Rein, & Watkins, 1995). Therefore, any embodied technique that will stimulate the PNS will help our clients have a more positive outlook and increase the likelihood of moving forward with their objectives.

The most-watched TEDx talk (more than 71 million views) was hosted by Princeton social psychologist Amy Cuddy. His talk, "Your Body Language May Shape Who You Are," shows how our postures influence our minds and how others perceive us. Embodiment work is essential to influence and shape our emotions (Cuddy, 2012).

At the Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital, people learn how to counter stress responses by using a combination of approaches that elicit relaxation. These include deep abdominal breathing, focusing on a soothing word (such as peace or calm), visualization of tranquil scenes, repetitive prayer, yoga, and tai chi (LeWine, 2024).

It's important at this point to explain the concept of another sense humans have called proprioception—the perception or awareness of the position and movement of the body. Otherwise known as kinesthesia, this is your body's ability to sense movement, action, and location and is present in every muscle movement (Melinosky, 2024).

Most of the embodiment techniques used in coaching try to make clients aware of what is happening in their bodies, bringing those sensations to the conscious mind. Guiding them on how to identify these sensations leads them to understand deeper processes that are happening in their minds. Everything is connected and the body is a key way of access to that information. These techniques use proprioception as a vehicle for understanding.



The table below shows the general characteristics and differences of the sympathetic and parasympathetic nervous systems, the two main divisions of the autonomic nervous system (ANS).

Parasympathetic nervous system	Sympathetic nervous system
Control the body's response while at rest	Control the body's response during a perceived threat
Rest and digest	Fight or flight
Counterbalance; restores body to a state of calm	Body speeds up, tenses up, and becomes more alert. Functions not critical to survival shut down.
Decreases heart rate	Increases contraction and heart rate
No involvement	Releases adrenaline
No involvement	Increases; converts glycogen to glucose for muscle energy
Neurons are cholinergic: acetylcholine	Neurons are mostly adrenergic: epinephrine / norepinephrine (acetylcholine)

(Furness, 2009)



Key Insights for Coaches on the Basic Brain Laws

1. Our brain is emotional by default. We are mainly emotional beings.

We have the capacity to manage emotions rather than be taken over by them. When coaches grasp this concept, they will start listening from a different inner place and understand the real messages our clients are giving us. The narratives tend to sound very logical and rational, and we must train ourselves to decode the emotion that supports the argument. Coaching sessions are guided by the emotions of our clients.

2. Our brain is subjective.

“We don’t see the world as it is, we see it as we are and as a result of our history and experiences.” –Anaïs Nin

We don’t all see the world in the same way. We each have a different lens built by our own story, genetic information, and experiences or epigenetic information. It’s important to check your understanding with your clients and not make assumptions; they’re always based on our own story and will therefore be biased by default. We need to take into account that we are full of prejudice and stereotypes. We cannot delete them from our brains, but we can be mindful and learn how to deal with them in a healthy and productive way.

3. Our brain needs to make sense of the world.

The brain naturally creates its own story of what’s happening or what needs to happen. The brain doesn’t care if the story is true, it cares if it makes sense (from its own perspective or experience). In this case, when it makes sense, the amygdala doesn’t react negatively or activate any kind of survival response.

Uncertainty, or not having information, is potentially dangerous. A client may start telling a story and might only focus on part of the story because that's the part that makes sense to them. For this reason, it's important to challenge your clients and dig to find what's missing. Is there another way to see it? What rules have they made up? The coaching technique of reframing is key here.

4. Brains are unfinished.

As of today, we do not know the limits of our brains, which implies some enormous possibilities. We are all part of the process of discovering it. It is a huge opportunity and responsibility at the same time. We sometimes tell ourselves (or others tell us), "This is the way I am," or "A leopard can never change its spots." But these claims are simply untrue.

We already described the powerful characteristic of our brain called neuroplasticity. We know that coaching works through neuroplasticity. It's a creative process and we can choose how we shape it based on what we are looking for. Our coaching to the idea "This is the way I am" can encourage instead, "*This (alternative) is the way I want to be.*" Here we help our clients see that they're responsible for their actions and decisions.

5. Our brain's default is optimism.

If you see your client in a negative loop (unless they happen to be in clinical depression), try asking the question, "Why did you get out of bed this morning?" If they chose to get out of bed, they were making a decision to move towards something unknown. At the very least, there's a desire to move, even though the future is uncertain.

Someone wanting to work with a coach is naturally optimistic as they *want* a change, they *want* to work on something unknown, and they *want* to move forward past their uncertainty. Being hopeful is, by default, a positive approach.

6. Our brain is a social organ.

We are social by design, to varying degrees. Whether in person or on social media, we naturally desire to connect with people. We are always looking to fulfill that basic need of belonging. In the words of T.S. Eliot in his introduction to *Dante's Inferno*, "Hell is a place where nothing connects with nothing."

PART 2

The Relationship Between Neuroscience and the CTI Coaching Model



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The CTI model encourages using embodiment techniques to get in touch with our somatic intelligence. When applied skillfully, this approach is highly effective in helping clients change and grow because it activates the necessary brain mechanisms and triggers neuroplasticity.

In addition to triggering the change process, the model also acts as the thread that intertwines, unifies, and activates all the essential brain components for change. It turns on key neural networks and facilitates the formation of new pathways.



The Three CTI Principles

The Co-Active Training Institute's principles signal the mindset needed during the coaching process.

1. Fulfillment = Vision & Working With Envisioning

Vision leads behavior. The key vision center is located in the occipital part of the brain and can control the rest of our thinking. A vision can awaken the emotional driver in our brain and bring the rational part to intervene in the process. This is how the whole brain gets involved in fulfilling the solution.

For coaching to be effective, it's important for clients to have a compelling vision. When a vision is appealing enough, the brain builds the pathway to work toward the vision. You can invite your clients to add more senses to their vision. The more senses involved, the higher the probability of them fulfilling their goal.

Every sense brings different emotions, and a desire for change is achieved when it's linked to our emotions. We should think beyond our five traditional senses and include interoception—the collection of senses providing information about the internal state of the body, including heart rate, respiration, hunger, fullness, temperature, pain, and any other emotional sensations (Weir, 2023).

A compelling vision will reduce fear and help draw us out of our comfort zone.

2. Balance = Reframing

According to Professor James Gross from Stanford University, “Reframing should be in the water we drink.”

Reframing, or considering different perspectives, is to act on the salience network to execute a change. It involves moving control from the task-positive network to the default mode network. In other words, we move from “one way of thinking” to “multiple doors of comprehension and potential solutions.”

Reframing is key for coaching work and balancing varying perspectives. The salience network is fueled by our emotions, so when we offer other perspectives, we will need to help our clients link them to their emotions. It enables the process to go faster and more smoothly.

Reframing allows curiosity to activate, where clients can become open to seeing their situation in a new way. In that moment, the brain will release dopamine, one of the most powerful neurotransmitters, to induce a “malleable” brain. This reaction turns on the centers of learning that prepare our brains to learn more.

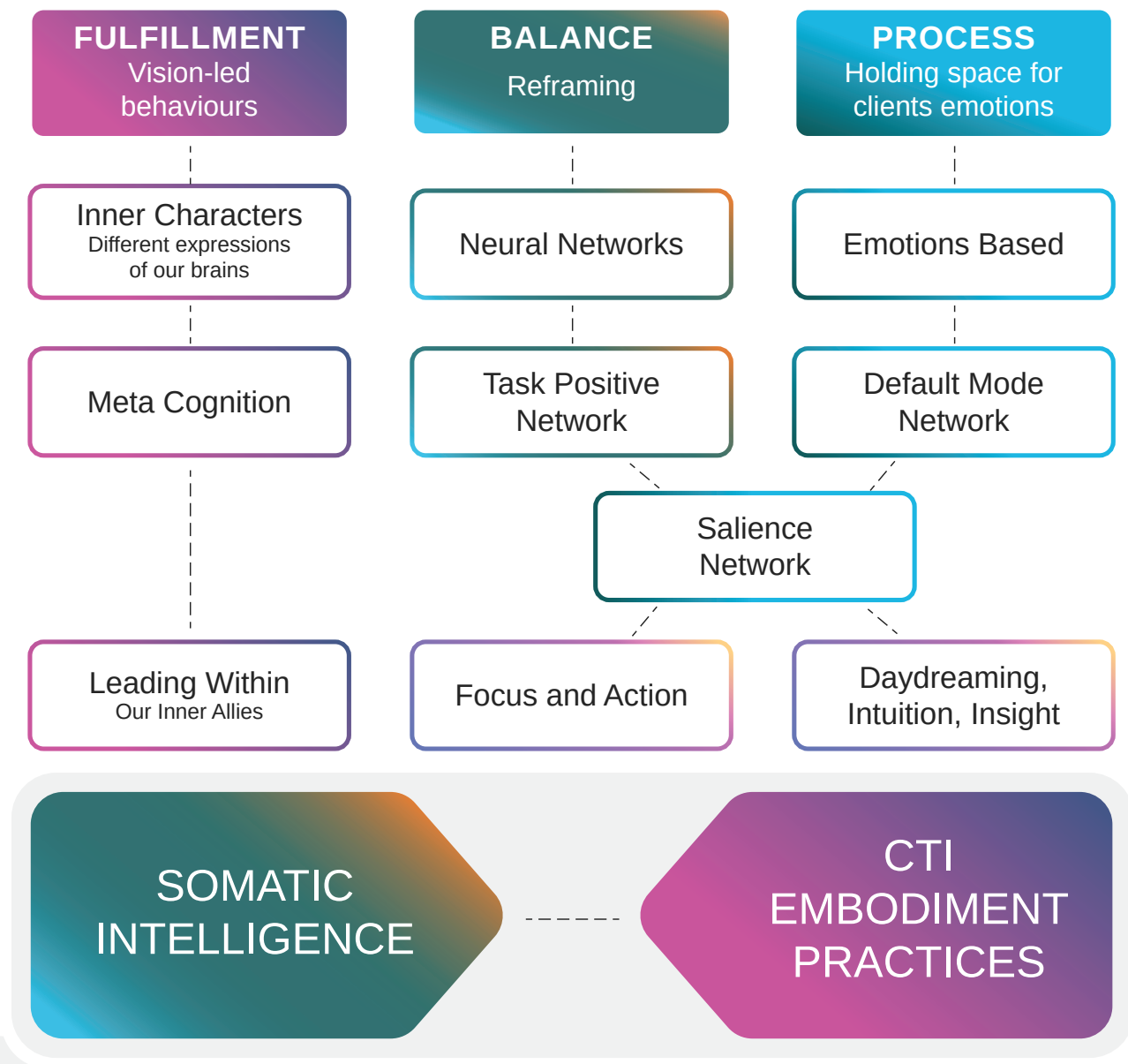


3. Process = Holding the Space for Our Clients' Emotions

Emotions are the doorway to consistent change. It is essential for us to create an environment where our clients can freely express what they feel without fear of being judged, interrupted, or dismissed. This approach to coaching allows them to process their emotions in a supportive and non-reactive way that leads to personal and professional development.

The following chart illustrates the connection between the CTI model and the corresponding elements of neuroscience described in this document.

THE THREE CTI PRINCIPLES



The Four CTI Cornerstones

The four cornerstones of the CTI coaching model are the mindsets of the coach. When one is activated, it has a ripple effect on the others.

1

Dance in the Moment

This metaphor reflects the importance of being flexible, responsive, and fully present during the coaching process. A coach must create a shared meaningful experience, adjusting to whatever arises in a session, being deeply attuned to the client's words, emotions, and energy, and maintaining grace and composure through difficult moments.

2

People Are Naturally Creative, Resourceful, and Whole

The brain is a powerful organ that conducts creative processes from an activated DMN. People are not broken and do not need fixing; they have their own innate wisdom on how to live life.

3

Evoke Transformation

Call forth radical, evolutionary changes, not small incremental changes.

4

Focus on the Whole Person

Work with the full range of one's humanity, rather than seeing only a particular circumstance, challenge, or opportunity.



PART 3

What Is the Impact of the CTI Model on Coaching Clients?



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The CTI model's holistic approach to coaching has a profound impact on clients, particularly in the following five areas.



1. Neuroplasticity

CTI's coaching model helps develop new neural pathways by encouraging new behaviors and thought patterns.

2. Trust

The CTI model places great emphasis on building trust with clients. They need to be “heard and held,” which induces the release of oxytocin or the “bond hormone.”

One of the functions of oxytocin is to induce relaxation, trust, and psychological stability and reduce stress responses (Lonstein, 2014). Oxytocin also induces an emotional sense of safety and high levels of social sensitivity (Grinevich, 2018) (Kosfeld, 2005). Among

synchronized individuals, it appears that oxytocin augments the expression of emotions vital to social communication (Spengler, 2017). This process also keeps the amygdala calm, preventing the activation of survival or defensive mechanisms (Resler, 2023). Armed with a greater degree of safety, our clients will activate the receptive neural networks in the brain, mainly through the DMN, and become more open to new perspectives.

3. Emotional Regulation

Coaches work through their clients' neural pathways, nudging the salience network linked with emotions and helping them identify, organize, and channel their emotions through the other key neural pathways to generate changes.

4. Empathy and Social Connections

In our coaching interactions, we activate the mirror neurons system, a group of specialized neurons located in our prefrontal cortex that “mirrors” the actions and behaviors of others (Rizzolati, 2004). We involve this system in neurocognitive functions like social cognition, language, empathy, and theory of mind (Rahimojan, 2007).

As clients mimic their coach’s attitude and approach, their brains process and hardwire what is learned in the coaching session. Clients also improve their social interactions and relationships as they become more attuned to others’ emotions and experiences.

5. Somatic Intelligence

Embodiment is a key element of CTI’s approach. This technique works by activating the vagus nerve, establishing a state where the body influences the brain toward change.

The CTI model’s approach will help your clients (and their brain) believe they are:

- Supported in a safe space.
- Heard with empathy.
- Accepted without negative judgment.
- Challenged in a sensitive manner.
- Accompanied on their path of development.
- Open to receiving and processing information without fear.
- Affirmed in the importance of their emotions.
- Guided on self-management through metacognition.
- Equipped to make changes through their somatic intelligence.
- Motivated to enhance their intuition.



Conclusion

The most effective coaches will understand the interplay between the brain's networks and incorporate neuroscience-informed techniques into their sessions. This might involve deepening your understanding of clients' emotional states, using specific exercises to target particular neural networks, or leveraging somatic intelligence to enhance self-awareness. By grounding your coaching in neuroscience, you can provide your clients with a more informed experience that leads to transformation and desired outcomes.

Co-Active Training Institute equips coaches and learners with a foundational, ever-evolving practice that shapes how people understand themselves and the world. The result is increased influence and relevance that materializes in and through others. For more practical leadership training resources, explore Co-Active's videos, webinars, blog posts, and other coaching tools.



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