



Daniela Roher, PhD, LPC.
Psychotherapist

Inner Journey: Getting to know who we are

By Daniela Roher, PhD, LPC.
Psychotherapist

We spend a lot of our time learning about the environment around us, so that we can improve our quality of life by creating a better fit with it. Unfortunately, however, often we don't spend as much time to get to know ourselves, taking our behaviors, feelings and body responses for granted, staying on the surface, rather than exploring the depths of our being. In so doing, we risk living a very superficial life, with little understanding and thus little ability to change those behaviors that are less than optimal and yet we keep repeating over and over again, because we don't have enough self-awareness to create healthier choices for ourselves.

Getting acquainted with who we are, on the other hand, allows us to maintain an ongoing connection with our thoughts, feelings, motivations, conflicts and desires. It helps us make informed decisions about what is good, appropriate and healthy to us, by explaining to us where our attractions, repulsions, impulses and wishes, as well as fears come from. It provides us with room to reflect on our experiences; it helps us put things in perspective, and be able to better anticipate and prepare for the future. It also gives us information about how to respond to different challenges; how we are affected by certain experiences, who and what we resonate with, and who and what we find alien to us. And, knowing ourselves enriches not only us but our intimate relationships as well, because by raising our awareness and sensitivity, it provides us with better ways of empathizing, communicating and sharing with our intimate partners.

As each of us is made of a body and a mind, this inner journey about what defines us and makes us similar yet different from anybody else, includes an exploration of our physical as well as our emotional selves, each part being mutually complementary and shaping and being shaped by each other.

We thus begin this journey with an exploration of our brain, which oversees and promotes our adaptability to our external environment and leads to the development of our minds, which provide us the gifts of understanding, communicating and feeling.

Part One: The Physiological Self

The human brain is made up of billions of cells, about one hundred billion of them, called **neurons**. Each neuron is made up of a center and different appendages, not unlike an octopus, with a central body and several tentacles emanating from it. These appendages are of two kinds: **dendrites** and **axons**. Each neural cell has several dendrites but only one axon. Neurons communicate with one another by sending electrical and chemical signals to one another through a small space called **synapse** that links one of their dendrites to the axon of another cell.

Each cell has an average of ten thousand synapses, which means that each neuron can communicate with about ten thousand other neurons, creating a spider-like web of over one hundred trillion synaptic connections! Communications between neurons occur via the transmission of molecules released by the axons called **neurotransmitters**. Most people may have heard of **serotonin**, one of the neurotransmitters that are affected by the use of antidepressant drugs such as Prozac, which enhance the chemical signals between cells.

At birth, our brain already contains most of the neurons, and these stay with us throughout our lives, but they are still incomplete. While neurons genetically encode the general brain structure, it is individual experiences that shape the expression of their specific neural activities, determining what kind of information is communicated, which pathways are formed and reinforced, and which ones are abandoned. Hence interpersonal experience, particularly in infancy and early childhood, is an integral part of how the brain works, influencing its function and structure, as it causes sensory stimulations. These, in turn, influence the connections between neurons, leading to specific thoughts, emotions and behaviors. We can see right away how important an **enriching** and **safe** environment is for an optimal development and maturation of our brain.

Because nature allows for as many choices as possible, by age two, a child's brain has twice as many synapses as adult brains, opening up opportunities for development of his or her mind in different areas. This process continues until adolescence and young adulthood, when the synapses that are not of any use are eliminated in a process called "**pruning**", not unlike the pruning of trees, with the purpose of eliminating the branches that are not needed and that may otherwise take nourishment away from the others that need strengthening, in this way shaping the course of development.

Because the adult brain is the result of the interplay of genetics and experience, the synapses that are not pruned are the ones deemed to be the most needed to best navigate and face the life challenges created by each particular environment. In a different environment, different synapses may get reinforced, as the ones best adapted to face a different set of challenges and others get pruned, as not necessary. By age twenty-five, the brain is considered "mature", though not static.

The brain is a very complex organ, made up of interconnected parts that serve different but complementary functions. It is made of two halves, called **hemispheres**, which develop at different times and have different functions.

The **right hemisphere** is the main seat of empathy, intense emotions and attachments. It provides whole views of experiences, gestalts of processed information, including how “to be” in intimate relationships. Its contents are more intuitive, social and self-reflective rather than logical. It develops before the left hemisphere and continues to be dominant for the first three years of a child’s life. This is where representations of early experiences that occurred before the development of language are stored. These representations are totally non-conscious and are non-consciously communicated to and from other right brains, primarily the maternal parent’s.

The way the human brain gets organized is embedded in the context of intimate relationships, because these are the most influential, particularly very early in life. These intimate connections are based on the interactions between the infant’s brain and the parental brain, and can be growth-facilitating or growth-inhibiting, according to how healthy they are. The different interpersonal experiences each of us has are what gives us our human abilities and our unique, individual characteristics, as well as at times being sources of emotional struggles throughout life, when not positive.

It all starts immediately after birth, when a child and the maternal parent communicate with one another exclusively at the body level, mother ‘downloading’ emotional information from the right hemisphere of her brain into her infant’s right brain, which needs this input to grow. This process is not dissimilar from information being downloaded from one computer to another. We can see, therefore, that not only at the psychological level, but at the physiological level as well, learning and maturation require physical and emotional interaction.

During the first few months of a baby’s life, these communications simply refer to sounds, particularly mother’s voice, which babies can recognize from others’ within the first two or three days after birth, as they were used to it from the womb, and human faces, primarily mother’s eyes and her entire face, which for a while constitute a baby’s entire universe. This non-verbal, affective system continues to operate throughout a person’s lifespan. However, as the left brain, with its circuitry for language and thinking develops, information from the right brain is progressively transferred to the left brain, which starts to become increasingly more important, leading the way for an affective experience to be both emotionally felt and verbally and intellectually processed. Emotional states are then expressed with the use of words and organized into logical sequences that are coherent and follow general rules understood by everyone. As words force us to engage both right and left hemispheres, this process leads to a

balance between thinking and feeling, which is the hallmark of psychological health.

When, as adults, we are attracted to a person and begin an emotional relationship, we return to the primacy of right brain-to-right brain communication. When we gaze into the other person's eyes, for instance, we feel the other's presence and respond in ways that are aimed at creating a deeper emotional connection and an emotional resonance between us and them.

The **left hemisphere**, by contrast, presides over the logical, analytical and linear processing of experience and language-based communication. This does not mean, however, that each hemisphere specializes in particular functions at the exclusion of others. Most human activities, as we just discussed, require the integration of the two hemispheres, including experiencing emotions, which exist in both hemispheres.

According to their functions, our brain can be divided into three distinct sub-systems.

The **brain stem**, also called **reptilian brain** is the oldest and presides to basic vital functions that make life possible, such as breathing, swallowing, heart beating. Its functions are involuntary. This is the only part of the brain that still functions when a person is brain dead. When this part no longer operates, there cannot life at all.

The **limbic system** is the center of our emotional life and coordinates the activities of the other two sub-systems. It presides to the regulation of our emotions, processes social interactions and gives meaning to our inner and external experiences by attaching emotions to them. This brain sub-system is particularly well developed in mammals, because of the importance of caring and attachment to our young and living in social groups.

The limbic system is where love is located and is also the site of our dreams, adding another layer to the depth of our emotional lives.

The **neocortex** has an executive function, as it presides to our abilities for reasoning, abstraction, imagination and other expressions of higher thinking, such as our ability to create symbols, the most elaborate of which is language. We use words to understand and reflect on our experiences and to communicate them to others. This is what makes human culture unique; as human language is the greatest abstraction our neocortex is capable of. The neocortex is the brain's most developed area, when compared to other animals, pointing to the enormous human leap created by the development of language.

The neocortex is the most complex part of the brain and the last to develop, both evolutionally and developmentally. The maternal parent's

neocortex, already developed, provides executive functions to the child's, filling in for the child's limitations and shaping its development along lines that reflect the parent's in particular and a particular culture at large.

Aside from providing a sophisticated understanding of internal and external reality, abstractions also allow for the storing and construction of memories and the conceptualization of a mental future, creating continuity between our past experiences, our present and the future. Self-awareness and the abstract notions of past and future allow for an awareness of oneself that is not only in the moment, but stretches across the entire lifespan, providing a consistent identity that organizes and pulls together the many experiences we are exposed to every minute of every day. Damasio, a leading neurologist, calls this the "autobiographical self."

These three parts that constitute the brain – the reptilian brain, the limbic system and the neocortex -- may act independently of one another, but most often they function together as experiences benefit from the input of all of them. The emotional and social input from the limbic system, as well as the bodily processes made possible by the brain stem, play a paramount role in the development and maintenance of the "higher" neocortex functions in a constant circular loop. So, for instance, if you are reading this at a time when you are tired and sleep deprived, it may be quite difficult to concentrate and easily grasp these concepts. The same holds true if you are sad, enraged, or scared. These emotions, in fact, interfere with your intellectual abilities and prevent them from functioning at their best. On the other hand, if you are studying something you personally experienced, this level of knowledge based on specific memories and emotions will add a new layer to your understanding of the subject, making it richer and more meaningful.

The limbic brain becomes particularly important when we explore, in the next section, the intricacies and vicissitudes of love and attachment. This part of the brain, in fact, enables one person to sense and connect with the inner world of another person and, when together, adjust and attune to each other in order to develop what's called **limbic resonance**. At the neuronal level, emotions are the outcome of neural integration -- the linking of various neurons in different parts of the brain.

A neural basis for our resonance with others is the existence of a special group of neurons called **mirror neurons**, which imitate others' behaviors, grasping not only others' actions, but also their intentions and motivations. Mirror neurons are regarded by some neuroscientists as the physical elements that make empathy possible, and are seen as implicated in autism, a developmental disorder characterized by inability to emotionally connect to others.

Limbic resonance carries information and affective states back and forth and changes all people involved. These emotional connections are the arena

where our feelings of love can be expressed. We need love to nurture and protect us, so that what might have felt scary, threatening or frightening when alone, can become a challenge that we are confident we can take on with the right support that gives us courage and strength. The challenge may be difficult, but we are confident it won't destroy us. Love can actually change the way our brain works, introducing new ways of seeing things, new ways of feeling and relating to these emotions and, thus, new ways of being.

Our brain is like a self-programming computer, whose hardware -- the neurons -- allows us to feel emotions, our software. Our emotions, in turn, affect our neurons, facilitating the development of new synapses in an endless cycle of interplay between genetics and experience. All the knowledge we possess, both intellectual and emotional, is created by our neurons communicating information to one another, and organizing such information in ways that allow us to create mental constructs and categories that stand for and reflect everything we experience. Through the use of various experiences and repetitions of key experiences, some pathways become increasing stronger and richer, leading to more complex emotions and thoughts.

When neurons communicate with one another, all kinds of information are being transmitted. New information is then compared to the previous one in order to be evaluated and assessed. It is then recorded, catalogued and stored in our memory bank for future reference and use. Each new piece of knowledge is not simply added to what was already there, like a stack of boxes neatly piled on top of each other, but it affects and changes the knowledge that was previously there, providing us with the opportunity to modify, revise and solidify our knowledge by integrating the new with the old.

All the memories that we store in our brains are a reflection of our life experiences, as well as our thoughts and feelings about them. As we mentioned earlier, they provide us with a sense of continuity, organization and progression. The constant element in all these memories is our self, who experiences them and is affected by them and in turn determines what kind of emotional impact our future experiences may have. Our sense of identity – who “I” am - therefore is maintained by the awareness that we are the subjects that make experiences possible, that record them and give them meanings and value.

Of certain memories we have awareness – we can recall them at will, re-experiencing not only the events but the emotions felt at the time we experienced them. These memories are called **explicit**, to differentiate them from **implicit** memories of which we have no awareness. Explicit memories contain **what** happened; implicit refer to **how** it happened. For instance, how to ride a bicycle is implicit; what happened to us one day when we were riding a bike is explicit.

A portion of our implicit memories go back to a time prior to the development of language, when we learned to be with others, read their body

languages, intuit how they felt about us and respond appropriately. To know how “to be” with others is, in fact, something all of us have learned intuitively rather than consciously, without being aware of any specific rule.

This very general view of our neuroanatomy offers a basic understanding of the different physiological elements that contribute to create our mind. These elements, it is important to note, are not static, but are constantly mutating, providing an optimal fit to our external environment. Of course, when we are very young, the brain is very plastic and many changes occur to better adapt to the external environment. As we age, the brain loses some of its plasticity, struggling more to adjust to environmental changes, as well as to our different emotional states. This is a reason why, as we age, we tend to become more comfortable with what we know and less inclined to embrace new experiences. This is also why learning may require more effort, as we tend to adjust our external environment to us, rather than the other way around as we did as children. At that time our brain was open and ready to pursue any direction or experience, rather than focusing on making the external environment conform to us.

Despite the slowing down in its neuro-plasticity, however, the brain continues to create new synaptic connections and even growing new neurons, when necessary. Studies carried out in stroke victims indicate new neural growth, changes in neural activities and new synapses developed in specific areas of the brain to compensate for the damage caused by the stroke.

The discovery of the brain neuroplasticity throughout life points to the importance of intellectually stimulating environments and safe emotional connections for the brain’s optimal functioning. Chronic stress and trauma, on the other hand, overburden and strain the brain’s abilities to cope with the environment, causing physical and emotional distress. When we are in distress, we tend to ensconce ourselves in positions that require the minimal amount of effort, as a lot of energy is taken up in managing the distress.

In part two of this journey, we explore our emotional world: how it develops, how it is maintained, what constitutes optimal mental health, and what we need to do to maintain well being and balance in body and mind.