

The most complex and wonderful living thing in the known universe... is sitting in your head! Some 100 billion brain cells (neurons), each of which make between 1,000 and 10,000 connections with other neurons, give us a living network of some 1,000 trillion connections. That's a very, very big number. If you turned the connectivity of the world's telephone network into brain connections, you would have a mere cubic centimetre of brain! Add the variation in ways each connection can operate (far more than simply on or off), and you have a degree of complexity that is way beyond comprehension – but enough for scientists to correlate many things about our human experience.

But focusers worship the body! We want to get out of our heads and into our bodies where we feel felt senses and felt shifts. Without a brain, however, Focusing wouldn't happen. You could not choose to do it, you would have no awareness of your felt sense, you would be unable to listen to what comes from it – in fact without a brain the body couldn't generate a felt sense to start with!

The brain is like the ocean. Most of what happens lies below the surface, and the contents of our conscious thoughts are just the waves breaking on it. The reason that focusers worship the body and sometimes disparage the brain is that we experience felt senses and shifts in the body and then make a huge mistake: we equate conscious thinking with what happens in our heads. But this is a minor part of what the brain does. Most mental life happens below the surface of consciousness – and much of it concerns the body. The really interesting stuff in Focusing happens in the brain.

Focusing has its roots in philosophy rather than science – as Gendlin is a philosopher, perhaps also because it's easier to combine personal experience with philosophy than with science. But the scientific world around Focusing is changing. When Freud created psychoanalysis, there was little understanding of the brain, and when Gene created Focusing, there wasn't a lot more. Back then, neuroscience restricted itself to studying behaviour and cognition. Now, however, it ventures into emotion and feeling, the mind–body question and consciousness – and it's catching up fast.

Science can help us to understand Focusing. I'm finding it fascinating to cross the emerging ideas of neuroscience with my experience of Focusing. It sheds light on some of our perennial questions. For example, we are not always clear what we mean by the 'body': do we mean just the centre of the body, or the whole physical body, or the body and the space around it? Similarly with the notion of 'felt sense': do we mean a physical sensation in the middle of the body, or a feeling anywhere that we can attend to, or just some vague sense of knowing that is not physically located? These theoretical questions have a bearing on the practice of Focusing and on how we teach it. So, let's take a peek at a few basic things about the brain.

First of all: the brain is in the body as well as in the head. We equate brain with head, but the brain is a part of the central nervous system that extends to the base of the spine. And the central nervous system connects directly with the peripheral nervous system that extends throughout the entire body. If you pulled a brain out of its body with all its connections intact, you would have six feet of dribbling nerve endings as well as the lump of jelly that sits in the head.

The human aspects of our brains sit on top of our evolutionary inheritance. At the bottom are the brain stem and cerebellum, known as the *reptilian brain*, that do basic things like putting you to sleep and waking you up. In the middle is the *limbic system* that we share with other mammals and that runs much of our emotional lives. It includes the amygdala that generates emotional reactions, the hypothalamus that adjusts body chemistry and the hippocampus that lays down memories. All these bits sit under the wrinkly stuff at the top, the *cortex*. This area is greatly expanded in humans and gives rise to what makes us human – such as language, conscious thought and the ability to know what we are feeling. Some of it gets called the *neocortex* – neo for 'new'.

The cortex divides up into four lobes: the *occipital lobe* at the back that deals with vision, the *parietal lobe* close to the back (movement, sensation etc.), the *temporal lobe* (sound, speech etc.), and the *frontal lobe* that does the clever stuff – thinking, conceptualising, planning, making decisions and, significantly for us, the conscious appreciation of emotion.

We can be saints and sinners. Whilst the cortex enables us to develop intellectually and spiritually, we nevertheless remain prey to the emotional urges of the limbic system – our addictions, desires, irrational anger and fear. The cortex can mediate the basic emotional reactions of the limbic system, but it doesn't always succeed. For example, if the amygdala goes into fear mode, it can knock out the normal functioning of the cortex and take over.

The brain is an electrical forest, with trees arranged in layers. Brains are like forests: each tree is a *neuron* with a deep root (an *axon*) that connects to one of the many branches (*dendrites*) of another tree via a *synapse*. The cortex is the outer layer of neuron-trees: inner layers are to be found in the limbic system and brainstem. As you read this paper, your brain will be making tens of thousands of new synaptic connections between neurons in your cortex – and losing some unnecessary ones at the same time.

The forest sits in a chemical soup. Neurons communicate in bursts of electrical activity that ‘fire’ chemical messages in the form of *neurotransmitters* across *synapses*. There are at least 50 different neurotransmitters, including serotonin that’s associated with optimism and dopamine that’s associated with arousal. As well as neurotransmitters, the chemical soup contains *hormones* like cortisol that regulates your stress level and oxytocin that floods your brain when you fall in love, and there are *neuropeptides* like endorphins and enkaphalins that reduce pain and stress. Candace Pert, a biochemist who wrote ‘*Molecules of Emotion*’, thinks all this chemistry is an “unconscious emotional vocabulary”. It adds further complexity to the already complex connectivity of neurons.

We have two brains in one. The two cerebral hemispheres comprise both the top level of the wrinkly cortex and the limbic system nestled underneath. So when people talk of the amygdala, for example, they really mean the two amygdalas. The two hemispheres are wired together: the *corpus callosum* bridges the left and right cortices, and the *anterior commissure* joins the two sides of the limbic system. The connections here take the form of reciprocal neural links i.e. axons from neurons in one hemisphere attach to dendrites of neurons in the other.

The left brain does the detail, the right brain does the big picture. The notion that the right brain is emotional whilst the left is logical is overly simplistic, but there is general agreement that the left brain is good at focused attention to detail and the right brain is good at opening to the broad context. You need both for any task. However, these differences in processing style give rise to areas of *dominance* where one side works harder, such as the following:-

left brain dominance	right brain dominance
positive emotions	negative emotions
approach behaviour	withdrawal behaviour
conscious processes	unconscious processes
smoothing over, denial, confabulation	noticing discrepancies and anomalies

Brain scans show that it’s mainly the right brain that lights up when something feels right or doesn’t feel right. The right brain is also considered dominant for the following:-

- integrated body sense: mapping the viscera (organs), muscles and bones
- subjective emotional experiences and emotionally-laden memories
- the empathic perception of others’ emotional states
- the non-verbal communication of unconscious states (through facial expression etc.)

The felt sense may be a right brain phenomenon. This side of the brain picks up subtle felt responses which may not break the surface of consciousness – then we act on a ‘hunch’. To hear them, we may need to ease up on the left brain. When we do become aware of such feelings, however, we then need the left brain to know and say what they are. And when we say “there’s something about this I don’t like but I can’t put my finger on it”, the neuroscientists would say that there’s incomplete brain communication: the left brain is unable to say what the right brain knows.

The brain is the body’s “captive audience”, according to Antonio Damasio, author of ‘*Descartes’ Error*’ and ‘*The Feeling of What Happens*’ (the books that originally fired my interest in neuroscience). There can be no brain without a body to inhabit, and no body could survive without a brain inside it. The body is a single organism that includes the specialist functions of the brain, which include those of taking account of what is happening in the body, including the part of it that is itself. Whilst the conscious mind generally “throws a veil” (Damasio) over the inner workings of the body so that it can attend to the outside world, nevertheless the brain pays very close attention to the body at all times, which acts as a “ground reference” for it – usually out of sight of consciousness. The parietal lobe carries a dynamic map of the inside of the body.

Emotions are in the body, feelings are in the brain. That’s the way neuroscientists like to use the language. ‘Emotion’ is what happens in the body (the whole of it, including the brain) in response to outer stimuli and inner thoughts, whereas ‘feeling’ is the representation in the brain of the emotion that happens in the body – most of this well beneath the surface of consciousness. There is no single emotion and feeling area of the brain because each emotion is a separate function using a

separate system in the brain. Emotion and feeling have more power in the brain than thoughts do – because there are more neural connections from the limbic system to the cortex than vice versa.

Emotion starts in the brain. Unless we deliberately make ourselves feel a certain way, that's not always our experience, of course. But, as we've seen, most of the brain's work lies out of range of conscious awareness. All levels of the brain participate in generating emotion. The brainstem regulates our feeling tired and feeling energised. The limbic system, especially the amygdala, kicks off our six 'primary' emotions: anger, fear, sadness, surprise, disgust and happiness. These are the emotions we're born with and that we share with animals. The more complex 'social' emotions like guilt, shame and embarrassment are 'cognitive constructs' that involve the cortex as well as what's below – these are more learnt and conditioned than the primary emotions. Emotions are like colours: you start with a few basic ones and then mix them to make any number of complex blends.

Emotion changes the brain. What's happening in the body not only gets signalled to the brain but it actually changes the way the brain works. The nervous system signals changes to the skin, blood vessels, organs, muscles and joints to the limbic system and the *somatosensory cortex* which lies in the parietal lobe. At the same time, the changing chemistry of hormones and peptides released in the body into the bloodstream finds its way up to the brain, and some of these chemicals penetrate the *blood brain barrier* that protects the brain from nasty things that get into the body. These neural and chemical signals lead to changes in the brain's cognitive state: for example, the brain can put more or less effort into processing the current body state. Body representations in the brain are 'online', dynamic and fresh, and normally unconscious – until, perhaps, we start focusing!

Another point to bear in mind here is that the brain knows the body's emotional states not only by receiving feedback from the body itself but also by knowing what emotional states it is itself generating. The frontal cortex gets a direct signal from the amygdala when the latter changes its emotional output to the body via the hypothalamus – and then later on hears from the somatosensory cortex how the body has changed as a result. So there are two ways of knowing.

The conscious appreciation of emotion is a cognitive process. This is Damasio's contention: "feelings are just as cognitive as any other perceptual image". And the areas of the frontal cortex that enable us to know consciously what we are feeling are the same areas that light up when we think. Four areas in particular: the *orbitofrontal cortex* that enables us to inhibit inappropriate actions (like drinking too much alcohol), the *dorsolateral prefrontal cortex* that holds things 'in mind', the *ventromedial cortex* where emotions are experienced and meaning bestowed upon them, and the *anterior cingulate cortex* that focuses our attention. Damage to these areas of the brain can lead to the inability to sustain normal relationships and to make sensible decisions – in part because the emotional processing of the brain no longer works properly.

The body is no longer the "exclusive theatre of the emotions" – the phrase of William James, the pioneering American psychologist of the nineteenth century, who proposed that the experience of emotion follows the perception of one's physiological reactions – "I'm trembling therefore I'm afraid". Whilst the body below the brain is a vital source of feelings, it is no longer the whole story. As we have seen, the brain detects changes in its own state as well as in the body state, and can register its own emotional impulses to the body before they happen there. Damasio adds two further contenders for feelings that do not have to involve a current body state. The first is 'as if' feelings – memories of past emotions that can influence the brain without having to be recreated in the body every time. The second he calls 'somatic markers': records of gut feelings that mark all sorts of experiences as basically pleasant or unpleasant and that later enable the brain to make decisions without necessarily having a current gut feeling. I find these ideas compatible with my own experience: sometimes I'm experiencing a current body state and other times I have 'feelings' that I am not experiencing as a particular physical sensation in my body at the time.

Consciousness is "the feeling of what happens". Damasio's proposal in his second book is that consciousness is a special sort of feeling: the feeling of what happens, which is really a feeling *of* a feeling. This sounds similar to our notion of a felt sense. The feeling is built on, first, the emotion in the body, and second, the feeling (in the brain) of that emotion. Consciousness is then the knowing that we have this feeling of that emotion. We share the two roots of consciousness with animals – to which humans add the third dimension, the capacity to know that we have a feeling. Animals are conscious but they may not know they have a feeling as we, sometimes, do know.

Damasio says that when the brain combines neural patterns for 1) an emotion, 2) the body, and 3) the interaction of emotion and body i.e. how the emotion is changing us inside, we become

conscious of what we feel. The first step of this is “the feeling of knowing that’s wordless”, and “only thereafter can inferences and interpretations begin to occur regarding the feeling of knowing”. This must be as close as it gets to a scientist describing what we call focusing!

Some tentative conclusions – crossing the ideas of neuroscience with our Focusing experience:–

1. Focusing involves a natural drift from habitual left brain dominance towards a balance of both hemispheres: it compensates for the tendency of modern living, with its paperwork and emails and hurry, to be left brain dominant, and increases the inter-connectedness of the two sides of the brain. Turning to the right brain risks our encountering emotional overwhelm, anxiety and unpleasant memories, hence the need for a sense of safety in Focusing – but it brings the benefits of a balance of thinking and feeling, body awareness, an openness to what lies below the surface of the ocean of the mind, and access to aspects of mental life like image, poetry, and depth of feeling that can get crowded out of our busy lives.

2. The felt sense may be a feeling in the right brain that the left brain cannot immediately symbolise. Sensing a feeling is right brain, naming it is left brain, and the felt shift when words fit the feeling involves both. Focusing may improve left/right brain communication by increasing the amount of synaptic connection between the two: this happens as we become better able to understand and articulate our feelings. Perhaps people who are naturally well endowed with synaptic connections in their corpus callosum have less need to learn Focusing than we do!

3. The ‘body’ we listen to in Focusing is the entire organism. By paying particular attention to the centre of the body, Focusing is grounded in our emotional being. To the entire organism, we could easily add the space around it due to the body’s sensitivity to whatever is around it. The physical body need not always be put at the centre of Focusing – but feeling must be. The brain is so cognisant of incoming information from the rest of the body that awareness of physical sensation may not always be necessary for us to reflect on what we’re feeling.

4. The physical feel of a situation is an emotional response. The benefit of turning attention towards physical sensation in the body is that it makes the two sides of the brain talk to each other and connects us to our emotional experience. If we ignore emotion, we risk splitting our minds in two. Emotion should have first call on what we attend to, but it is not necessary to focus on bodily emotion to do Focusing. There are many ways to know how we’re feeling, not all of which require physical sensation. So we must begin with the physically felt body whilst not being beholden to it.

5. The felt sense is not a physical sensation, it’s the feeling of consciousness. Is the felt sense a sensation, e.g. a tightness in the chest, or is it ‘the edge of awareness’? How can it be both? I suggest that the latter description is the right one. However, when we attend to a physical sensation, then we have a felt sense of it. But we can equally attend to any other feeling, including those lacking a distinctive body sensation, and we can attend to thoughts and images and have a sense of them in the same way. The felt sense that guides me through my daily life when I pay attention to it is not usually a physical sensation, but a subtler sense of what feels right and what doesn’t. When I have a nagging physical sensation, it is often an undigested aspect of my emotional life. Felt sense is consciousness – it’s always there but we tend not to notice it. I think we need either to sense in the physical body or to have a body-centred awareness, in order to find the felt sense. But all that physical sensation stuff we talk about in Focusing, that’s emotion.

6. Focusing is a reflective practice based on the feeling of consciousness. Consciousness is there in the background, but whether we use it is another matter. We can sail through much of life on autopilot, not bothering to reflect on our experience. In Focusing, as in certain other human activities, we do make use of consciousness. By giving precedence to bodily emotion, we gain a sense of wholeness and we keep the practice grounded in our humanity. But if there is no particular bodily emotion other than a general sense of wellbeing, Focusing can be directed towards other aspects of our inner life. A consequence of this is that a person may be focusing naturally when they have never learnt Focusing: what we have is a practice based on what some people do some of the time but most of us can benefit from doing more of, more of the time. This is pretty much, surely, as Gendlin explained it when he first developed focusing instructions in the 1960’s!

Peter Afford ~ May 2006 ~ peter@focusing.co.uk ~ comments please!