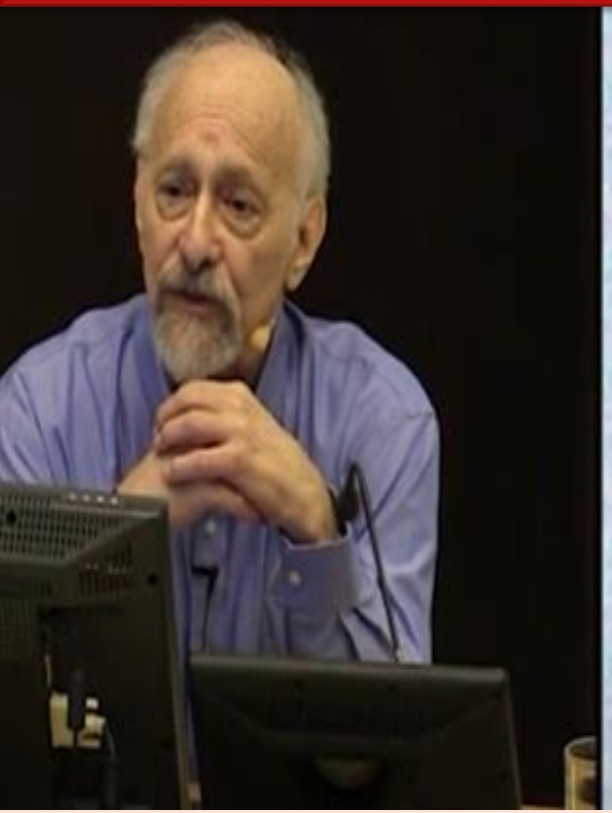
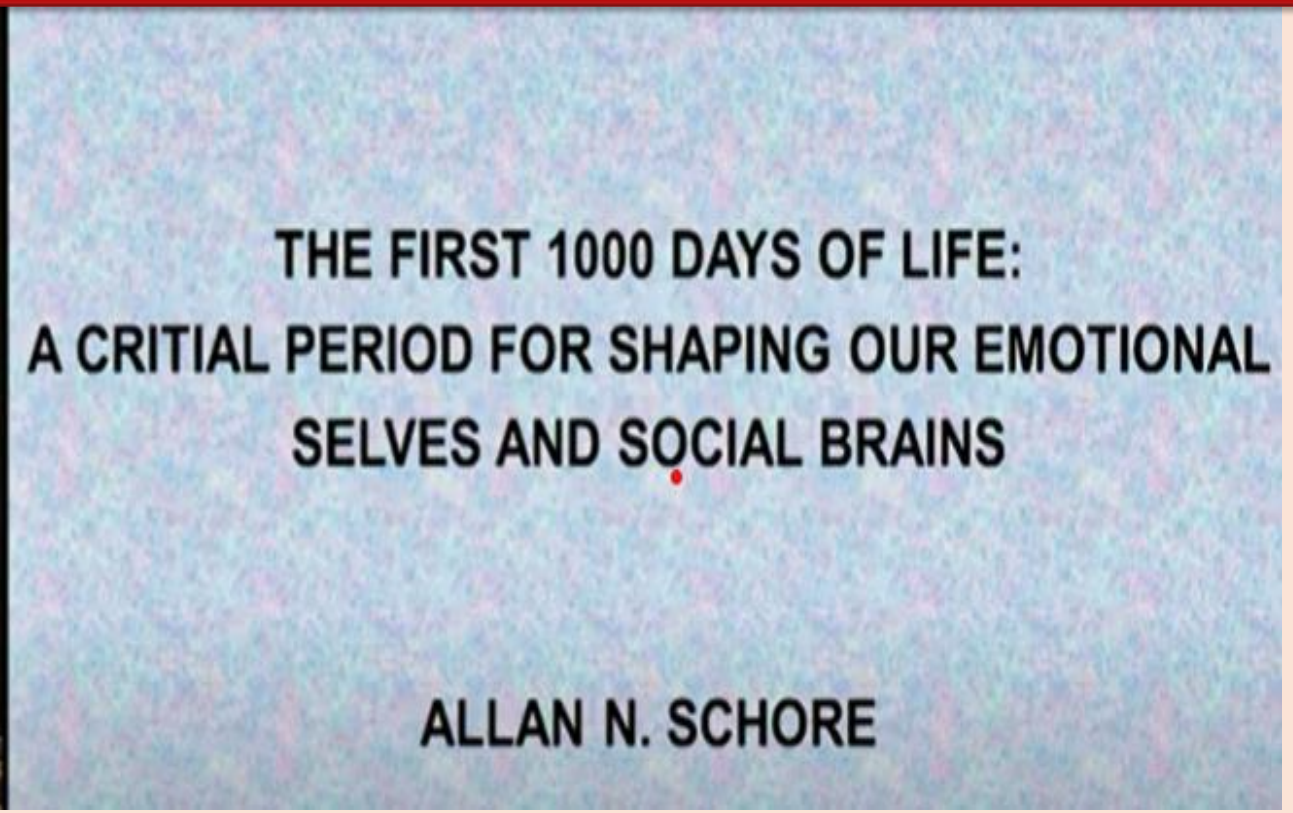
Neuroscience and the Inner Child

with Dr Chris

THE FIRST 1,000 DAYS





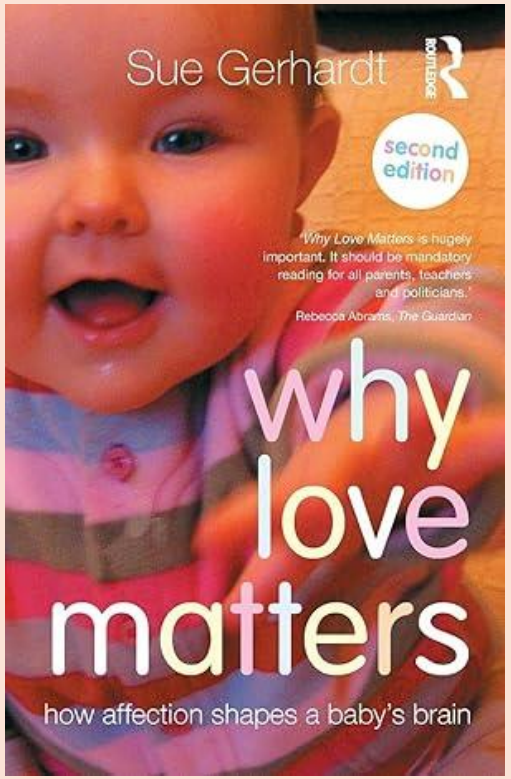
24th John Bowlby Memorial Conference – "Shame Matters"

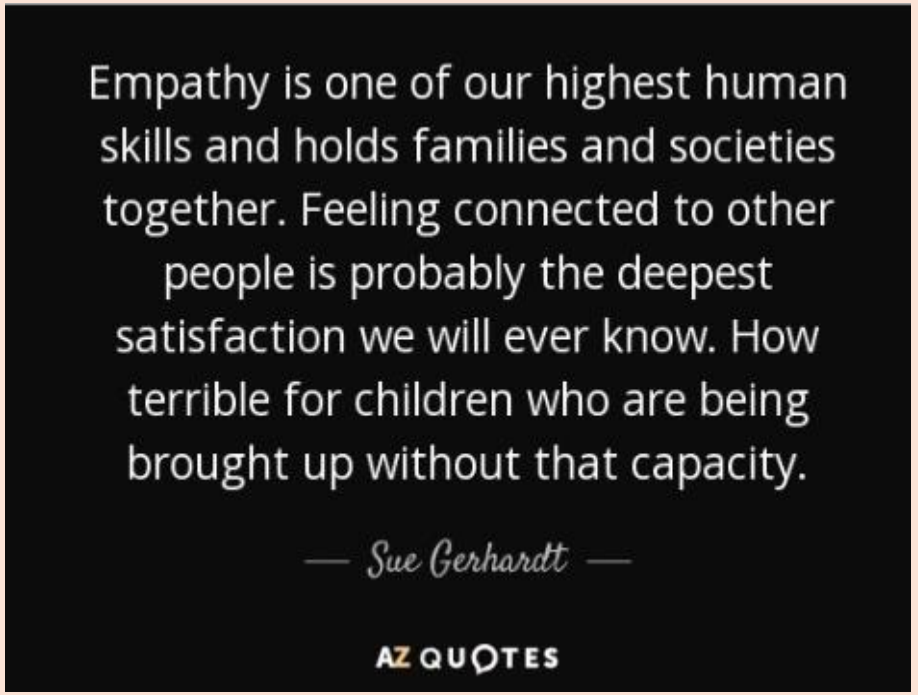
September 2018

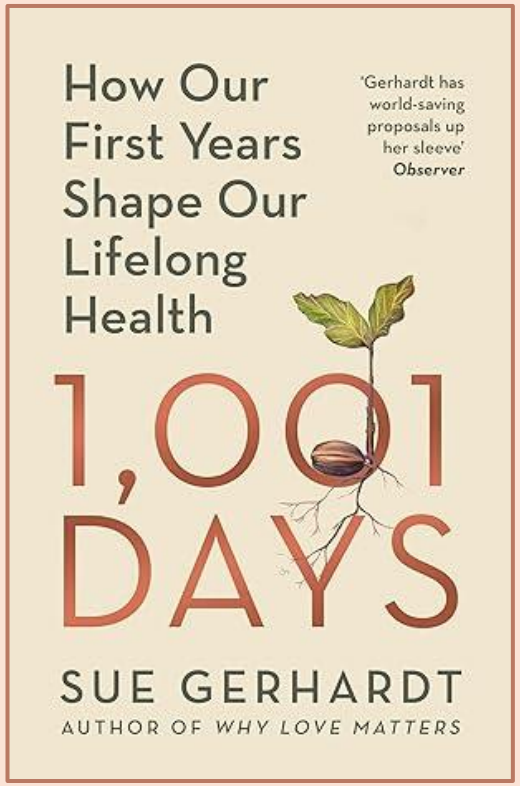
"What you can't see" – Bessel van der Kolk

*"Developmental trauma occurs between the moment of conception, and **before** the onset of conscious verbal thought at age two or three. That's actually a very long time for a foetus and an infant."*

https://www.pacesconnection.com/blog/developmental-trauma-what-you-can-t-see

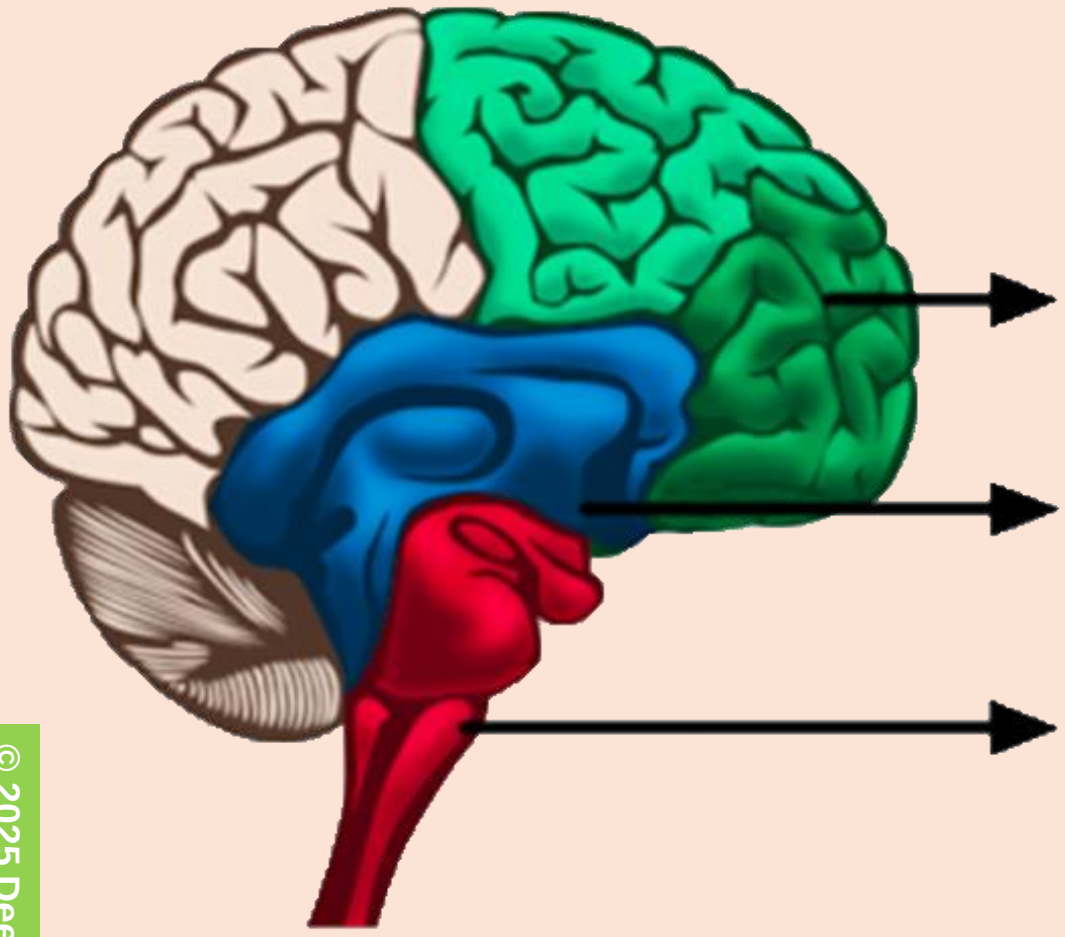






Sue Gerhardt

THE TRIUNE HUMAN BRAIN



Prefrontal Cortex – Thinking Mind

Limbic System – Feeling Mind

Brain Stem – Survival Mind

Development in the Womb: THE SURVIVAL MIND

- The Survival Mind is the most well-organised during the first three months in the womb
- Events at this stage are laid down very deeply in the foetal system – "first line level"
- Experiences of raw pain
- Memory of events and imprinted pain is at its least accessible
- There is no language to help us understand it - this level can only be reached on its own terms

Development in the Womb: THE FEELING MIND

- The Feeling Mind develops later in the womb
- Events are laid down at an emotional - “second line” level
- Raw pain is given an emotional overlay
- After birth the infant develops attachment to their parents and relatives and is able to feel emotional suffering as well as physical discomfort and hurt

Development in the Womb: THE THINKING MIND

- The ‘third line’ level – laid down by 6 months gestational age and growing progressively in complexity into adolescence
- Abilities to reason and cope with logic, then with philosophical ideas, are a function of brain maturation
- Conscious recognition of pain

EARLY BRAIN DEVELOPMENT

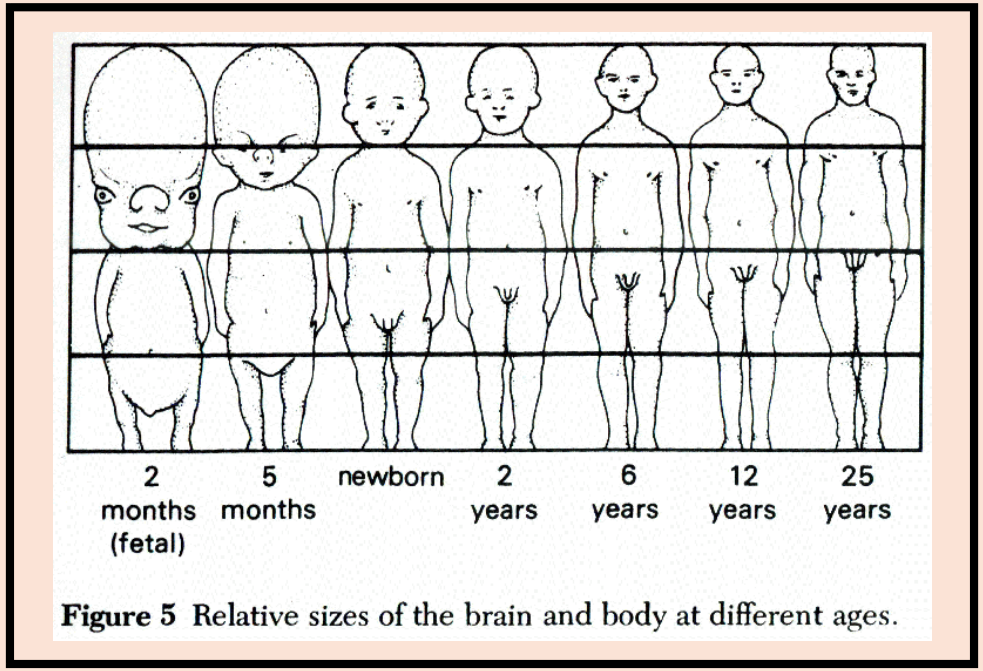
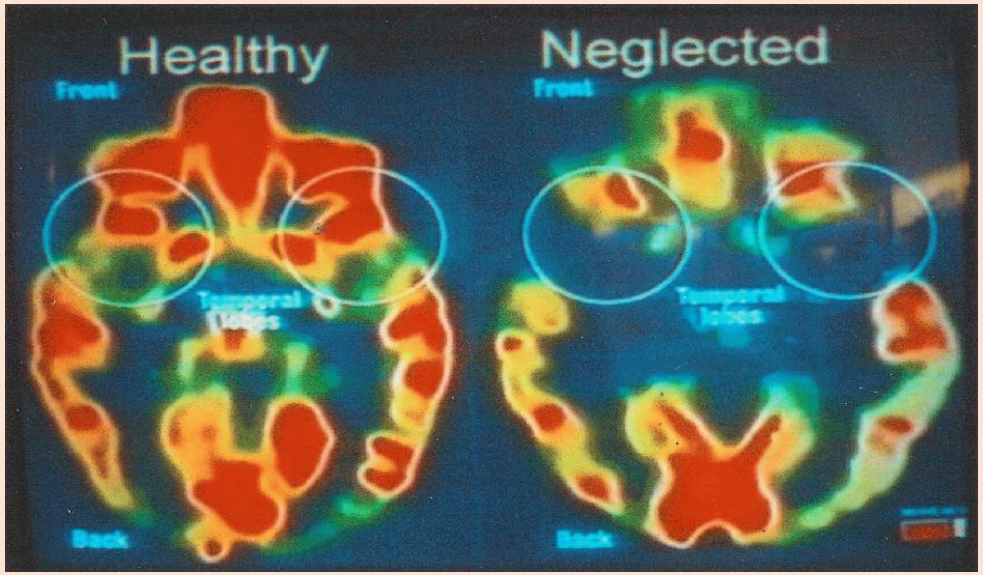
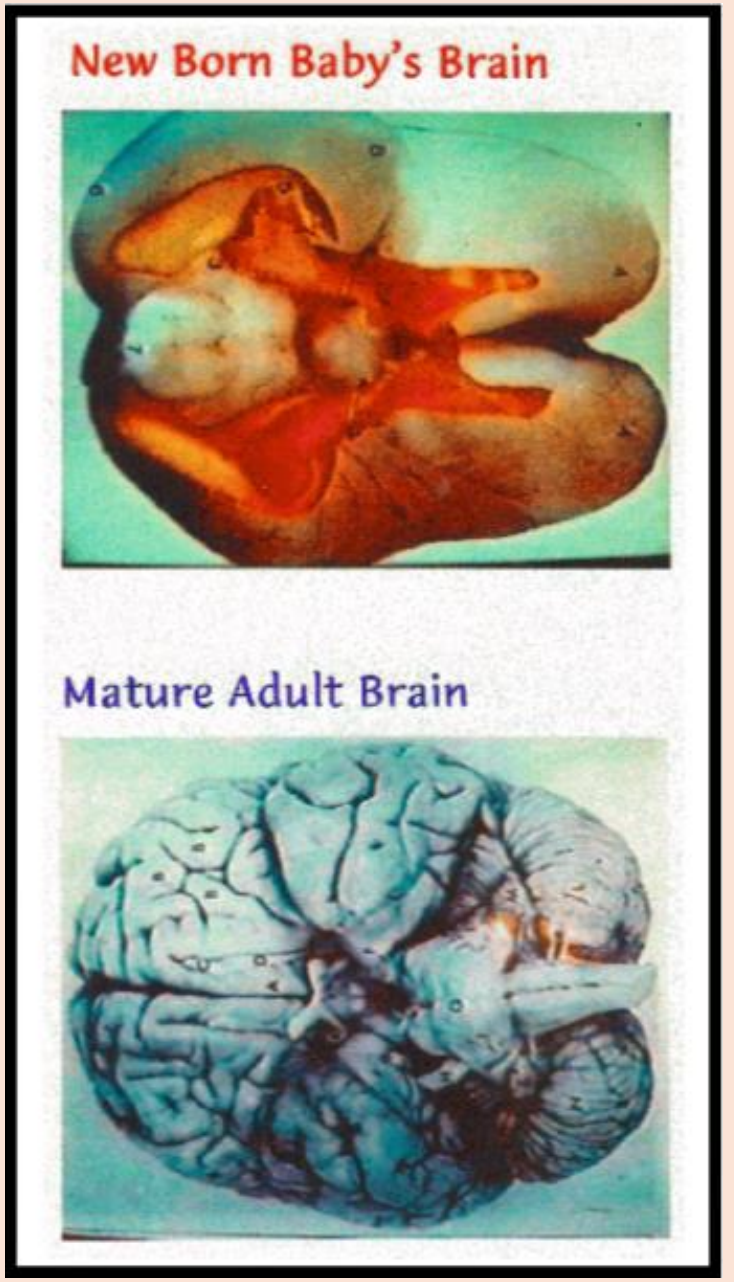


Figure 5 Relative sizes of the brain and body at different ages.





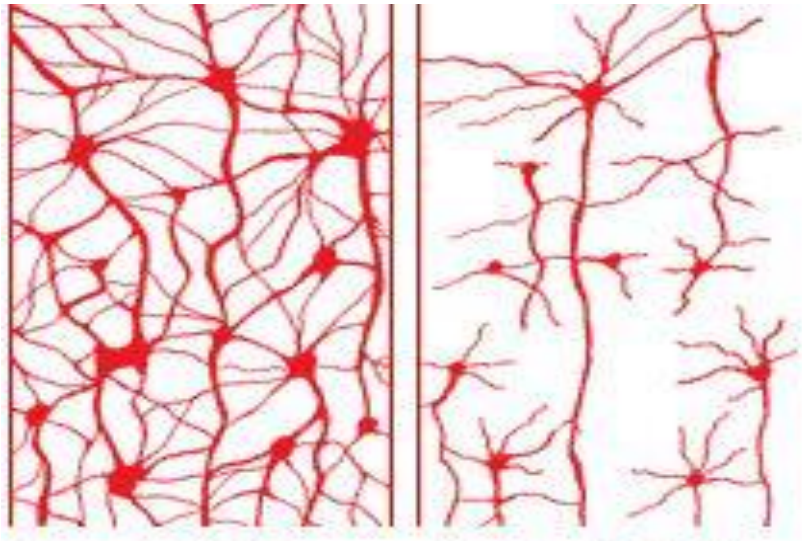
Shatz, C. (1992), The Developing Brain. Scientific American, Vol. 267, No. 3.

NEURONAL DEVELOPMENT

There are rapid growth of neurones and their connections at particular times:

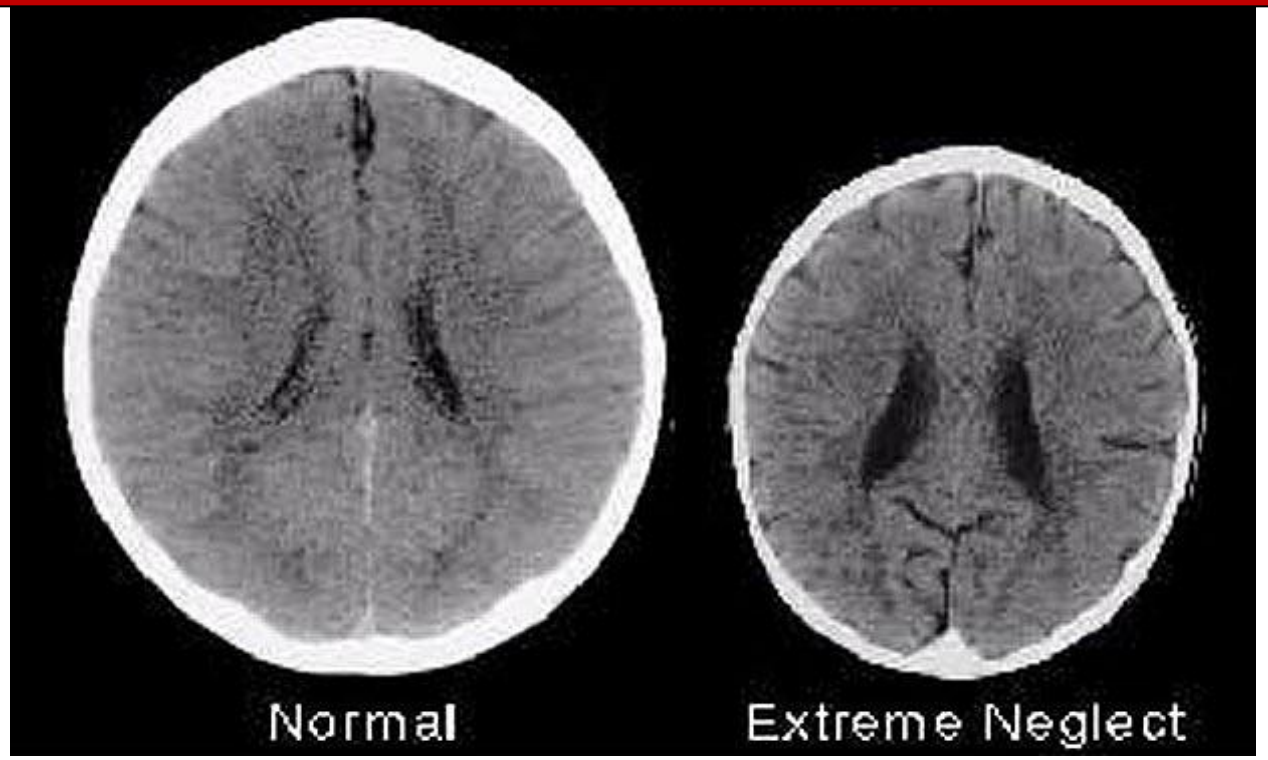
1. In the womb
2. In the first year
3. In early teenage years

Cells that fire together wire together!



Stimulated Brain Cells Unstimulated Brain Cells

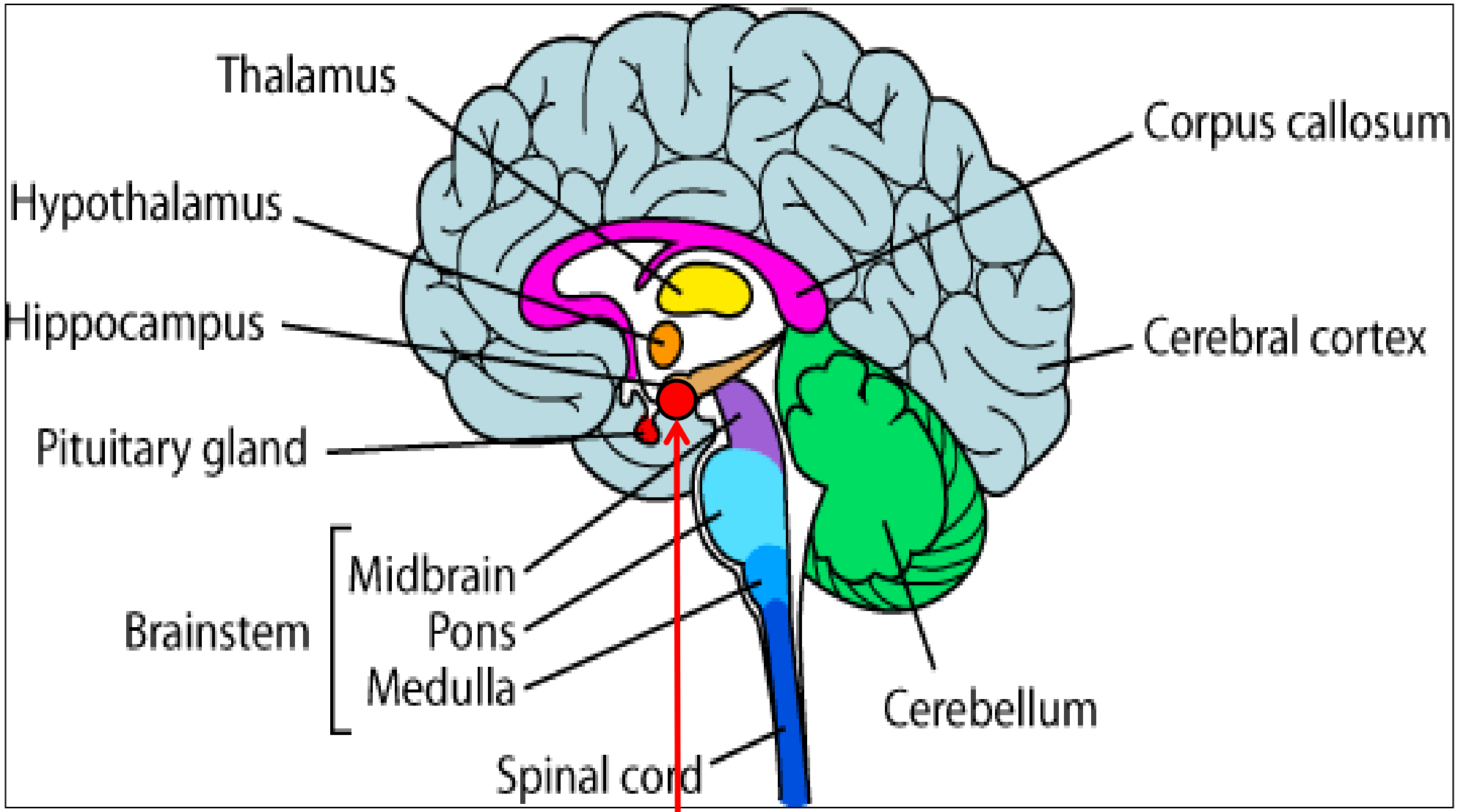
Telegraph Article October 2012



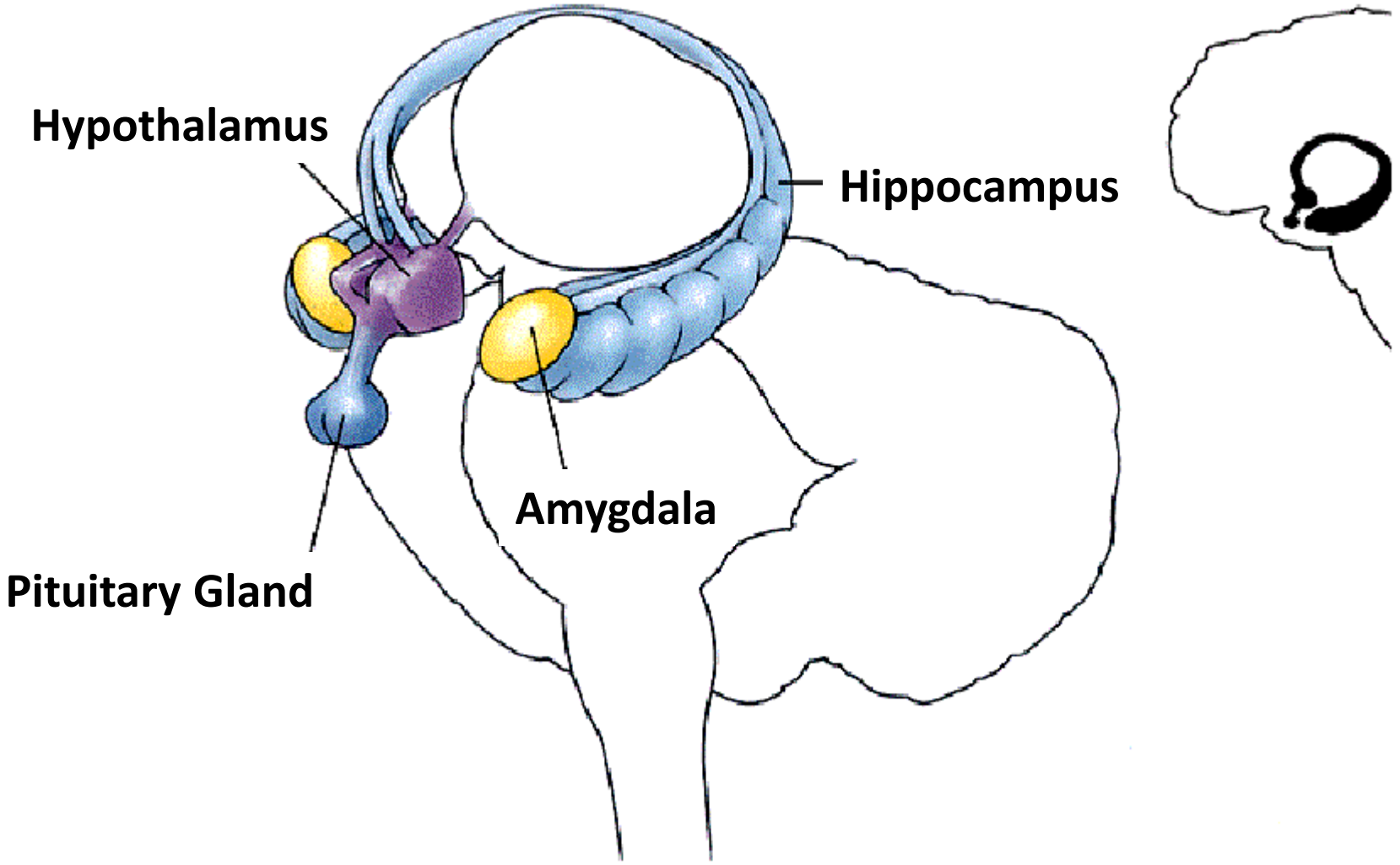
- The child with the much more fully developed brain was cherished by its mother, who was constantly and fully responsive to her baby

- The child with the shriveled brain was neglected and abused

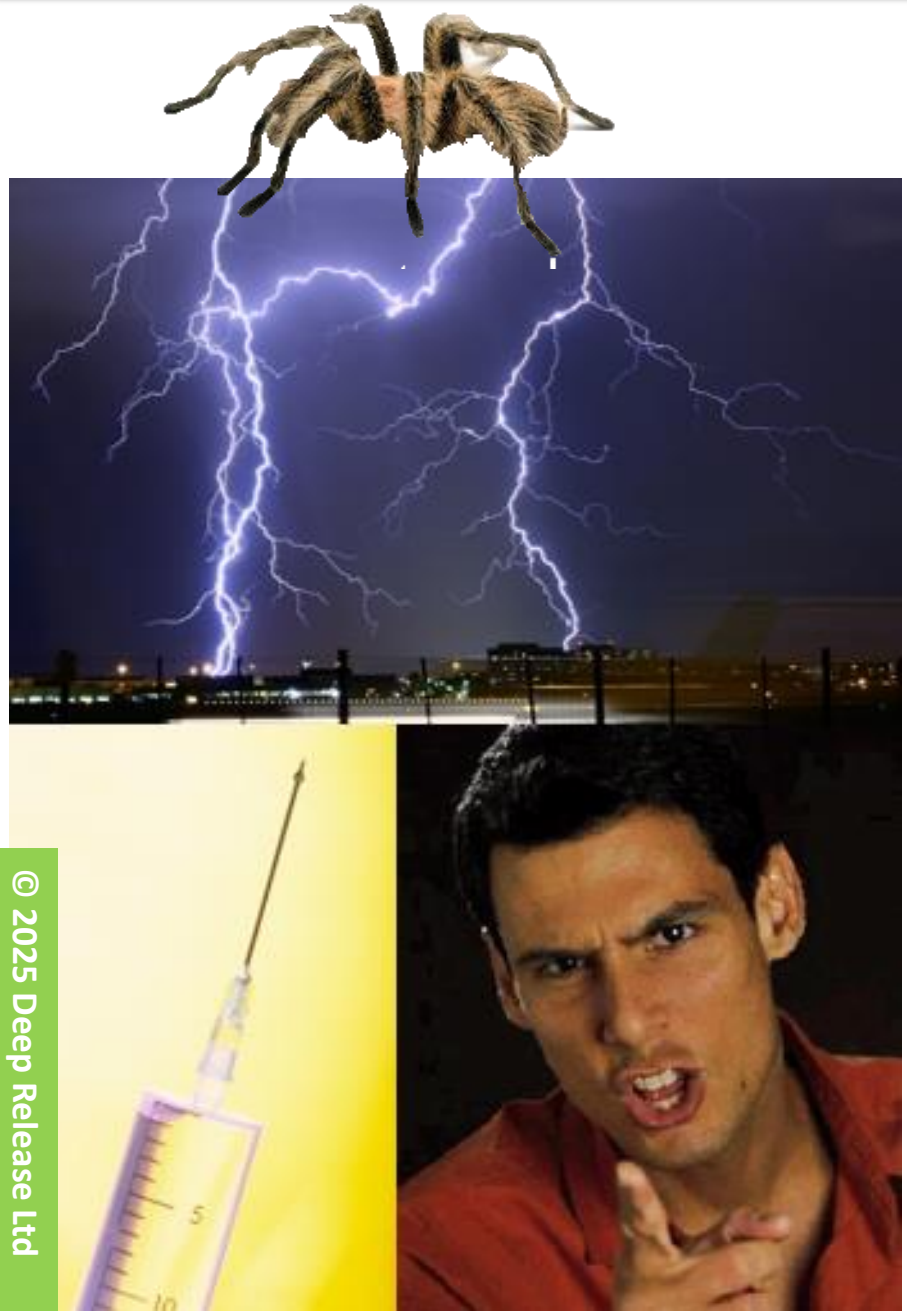
THE INSIDE OF THE BRAIN

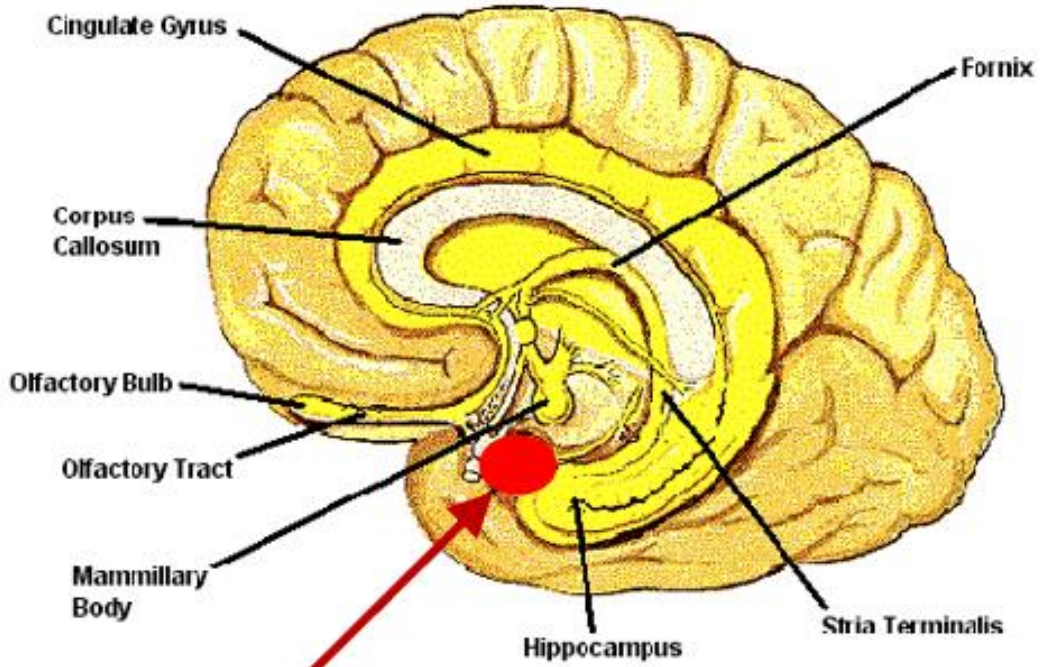


SIMPLIFIED LIMBIC SYSTEM



THE AMYGDALA





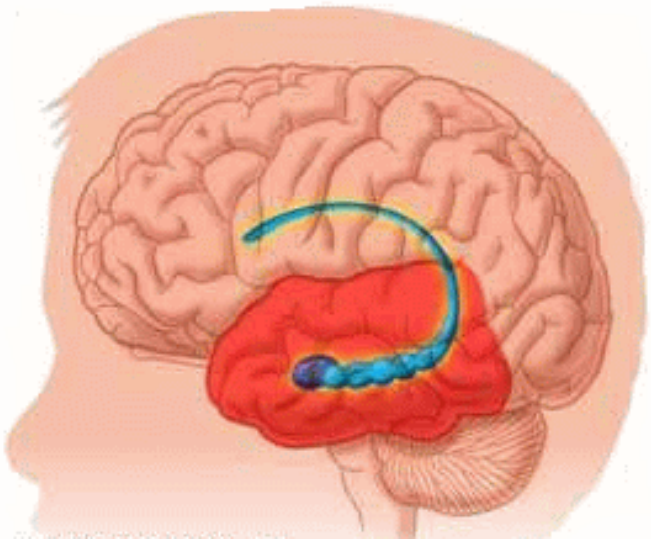
The Amygdala(e)

The Amygdala is the brain's radar system.
It is an almond-shaped brain structure located on the tip of the hippocampus.
There are 2 amygdalae, and one on the left and one on the right side of the brain.

THE HIPPOCAMPUS

The hippocampus is shaped like a sea horse. It is a paired structure, with one hippocampus located in the leftbrain hemisphere and the other in the right hemisphere.

- **Memory**
- **Learning**
- **Emotion**



- Particularly important in forming new memories and connecting emotions and senses, such as smell and sound, to memories.
- The hippocampus acts as a Memory Index by sending memories out to the appropriate part of the cerebral hemisphere for long-term storage and retrieving them when necessary.

THE HIPPOCAMPUS

- Studies on people with depression, chronic PTSD (eg war veterans and childhood sexual abuse survivors) have shown that their hippocampus is reduced in volume (most likely related to the stress hormone, cortisol)
- The Hippocampus is one of the most plastic and adaptable of brain areas
- This gives hope for survivors that hippocampal damage in PTSD is reversible once they have recovered

EARLY BRAIN DEVELOPMENT

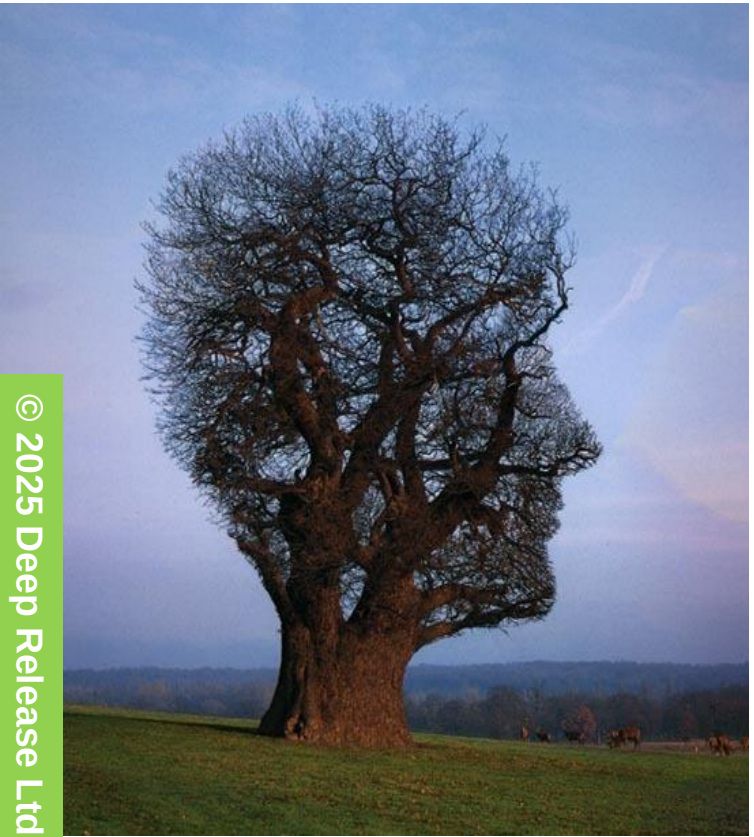
By the age of 3, the neurons in the brain have made 1,000 trillion connections! A single cell can connect with 15,000 or more other cells. If you don't use it, you lose it!

In the first year of life, JOY is the key to Attachment. As the parent plays with the child and has fun and laughter, high levels of rich emotion are achieved and brain development progresses rapidly.

NEUROPLASCTICITY

Stress, depression and trauma have all been shown to reduce the neuroplasticity of the brain

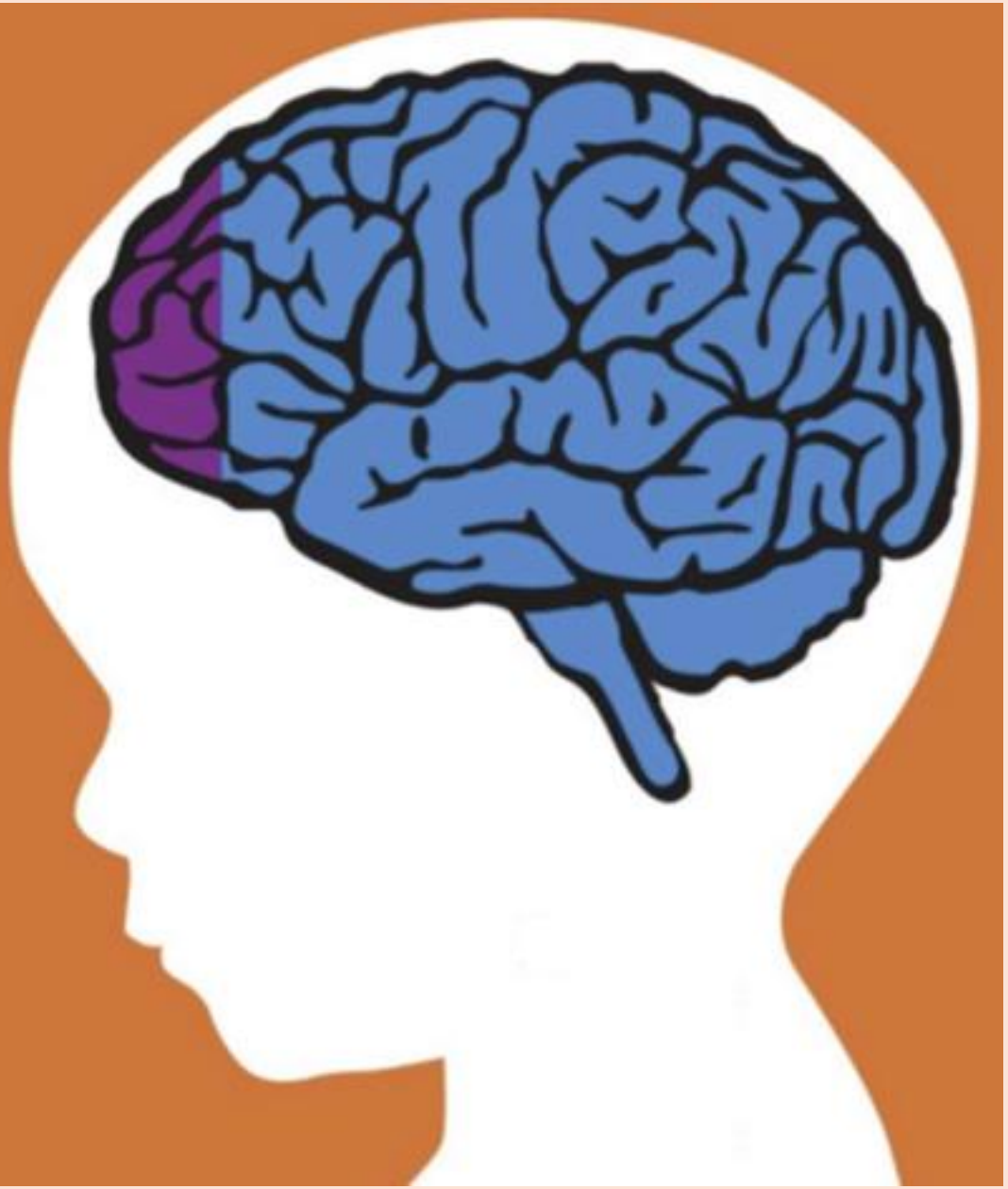
The good news is that once stress is reduced the synapses are replaced!



The brain can not only regenerate neural connections but the neurons themselves!

90%

of a child's brain development happens before age 5



PIAGET'S STAGES OF COGNITIVE DEVELOPMENT

0 - 2
The child begins to interact with the environment

SENSORIMOTOR STAGE

PREOPERATIONAL STAGE

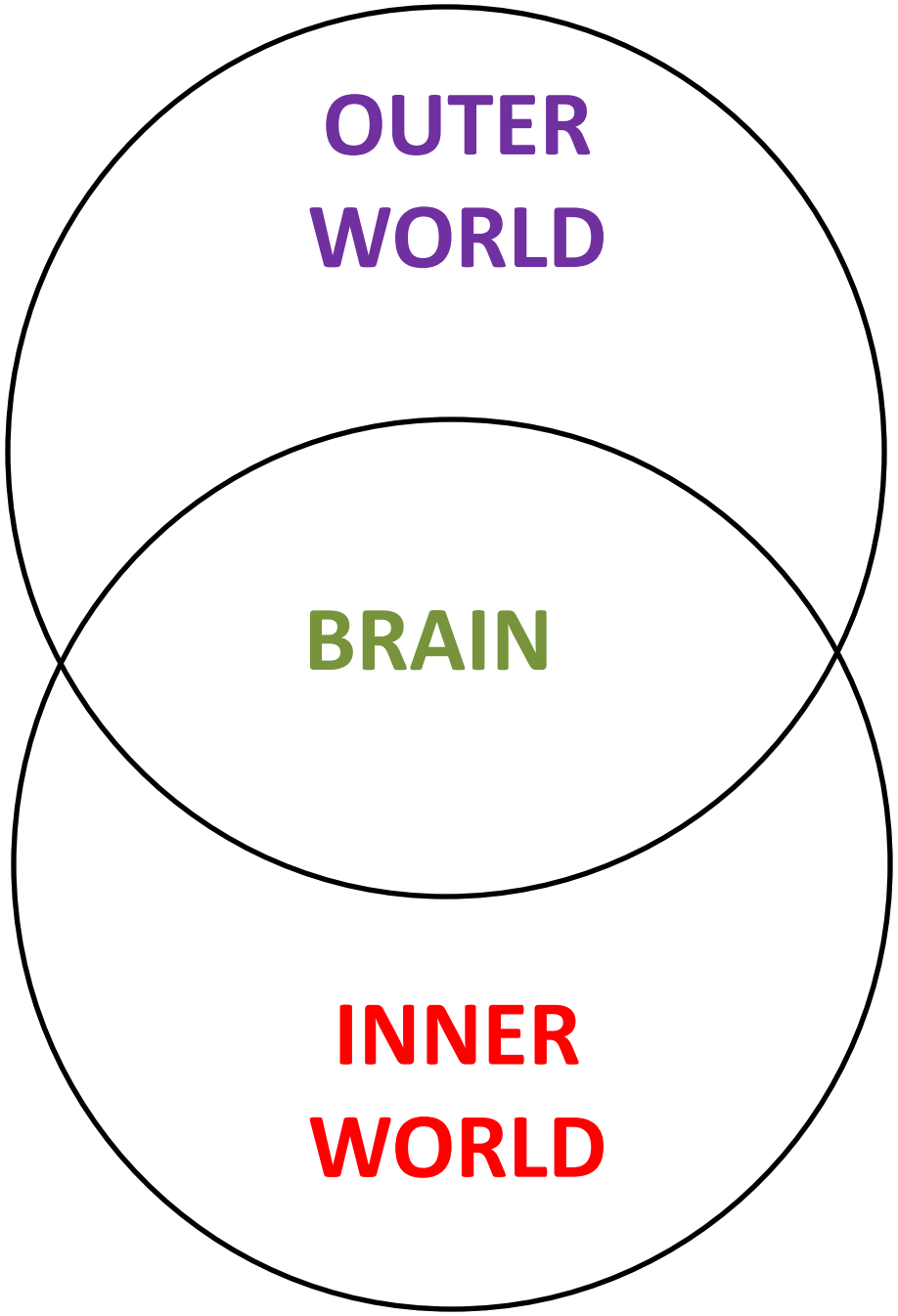
2 - 6/7
The child begins to represent the world symbolically

7 - 11/12
The child learns rules such as conservation

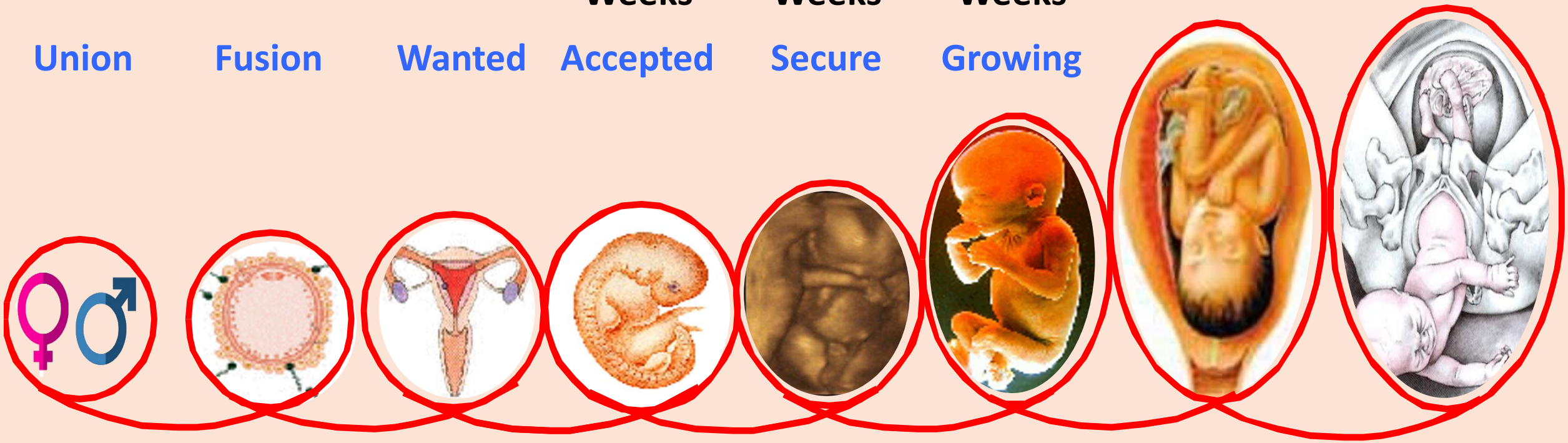
CONCRETE OPERATIONAL STAGE

FORMAL OPERATIONAL STAGE

12 – adult
The adolescent can transcend the concrete situation and think about the future



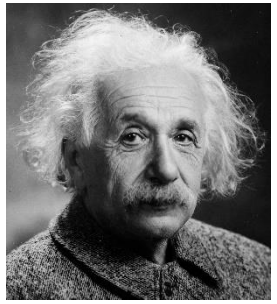
WOMB CYCLES

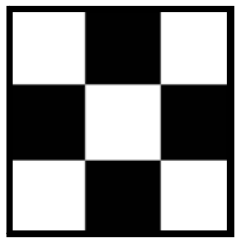


ERIKSON'S LIFE STAGES (EXPANDED)

0-2 years INFANCY	2-4 years EARLY CHILDHOOD	4-6 years MIDDLE CHILDHOOD	7-11 years LATE CHILDHOOD	12-18 years EARLY ADOLESCENCE	19-24 years ADOLESCENCE	25-45 years ADULT-HOOD	45-65 years MIDDLE AGE	65+ years SENIOR AGE
								
Trust	Autonomy	Initiative	Competence	Group Identity	Identity	Intimacy	Productivity	Integrity
Mistrust	Doubt Shame	Guilt	Inferiority	Alienation	Role Confusion	Isolation	Stagnation	Despair
								

THE TWO HALVES OF THE BRAIN





"NO!"

The Left Hemisphere

LOGICAL

LEGAL

LINEAR

LINGUISTIC

LITERAL

The Right Hemisphere

RELATIONAL

ARTISTIC

RHYTHM

RHYME

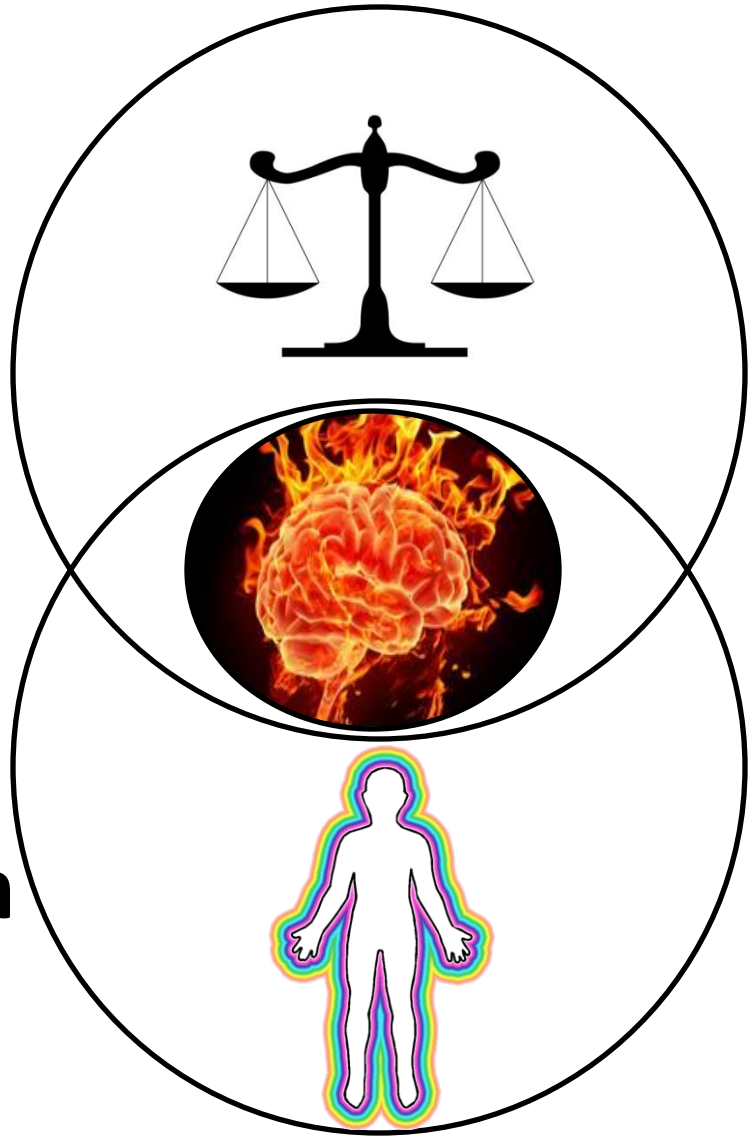
RESPONSIVE

REACH FOR THE STARS

RISK-TAKING

"Why Not?"

THE TOP-DOWN BRAIN



Cortex — **Thinking**

Limbic System — **Feeling**

Hindbrain — **Being/Doing**

THE FOURTH BRAIN

The Visceral Nervous System

One hundred million nerve cells in your guts!

- Your body's response is ahead of your brain's – it registers before your brain has an explanation
- Our vagal nerve connects the brain to the most visceral organs (heart, lungs, stomach intestines ++)

- When someone has experienced trauma the viscera often stay on high alert, even if the mind has moved on, eg chronic stomach pain, IBS, tight chest, shortness of breath, a sense of 'dread' or unexplained internal tension. They are body memories.
- The visceral nervous system is your emotional barometer – when we learn to listen to it, we can begin to heal trauma *from the inside out.*

THE FIFTH BRAIN

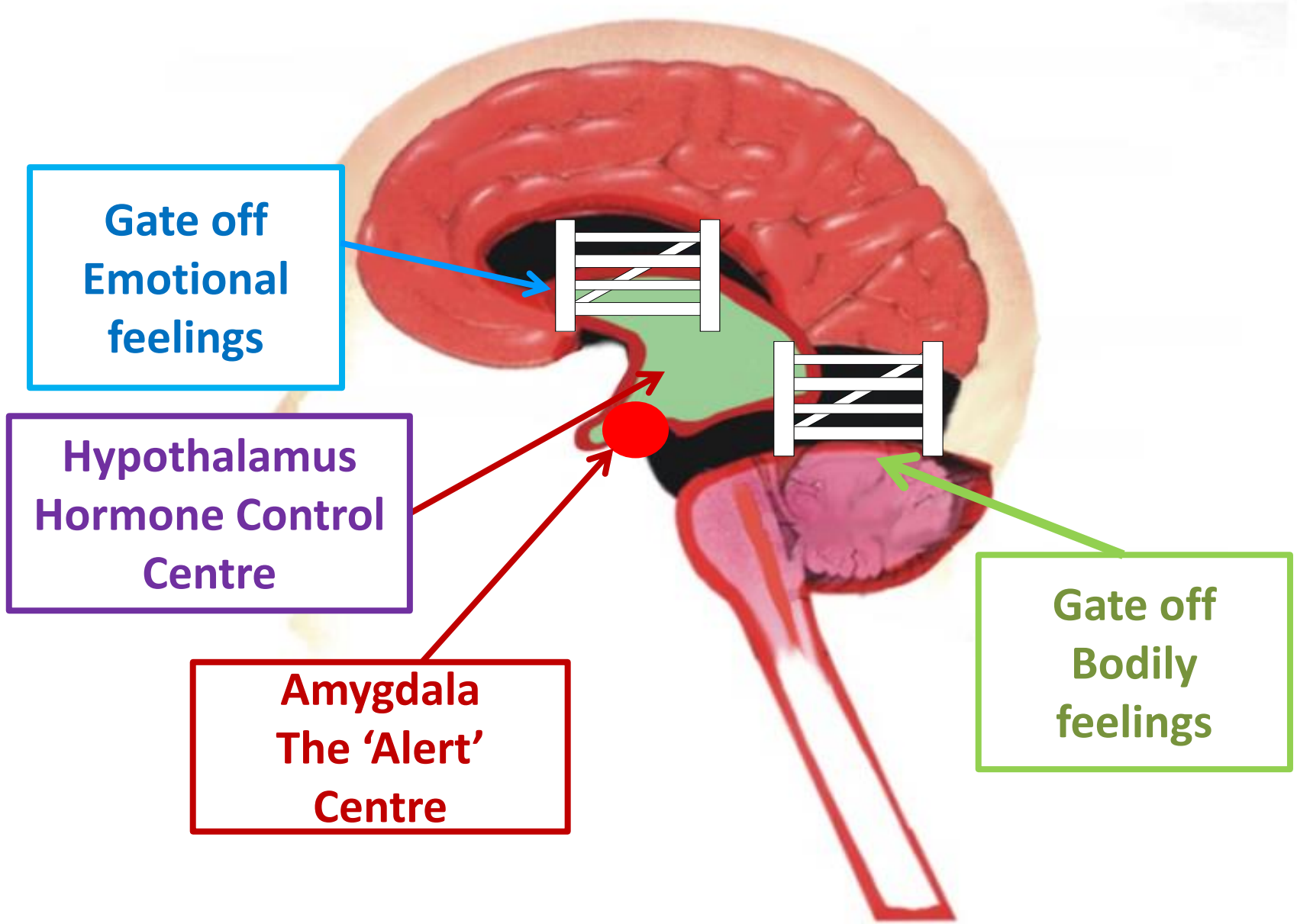
The Cardiac Nervous System

40,000 nerve cells – *it's heartfelt*!

- Can sense, feel, learn and remember *independently* of the brain in your head
- The heart sends more signals to the brain than the brain sends to the heart, mostly through the vagus nerve, a major highway in the autonomic nervous system.

- The heart plays a huge role in regulating emotions and affecting brain function.
- Emotional states like **gratitude**, **compassion** and **love** synchronise heart rhythms which improves brain function and creates ***heart coherence***.
- ***Stress and trauma create erratic, disordered rhythms that send distress signals back to the brain.***

PRIMAL GATING : THE 'SPLIT' BRAIN



DOWN THE SPIRAL STAIRCASE

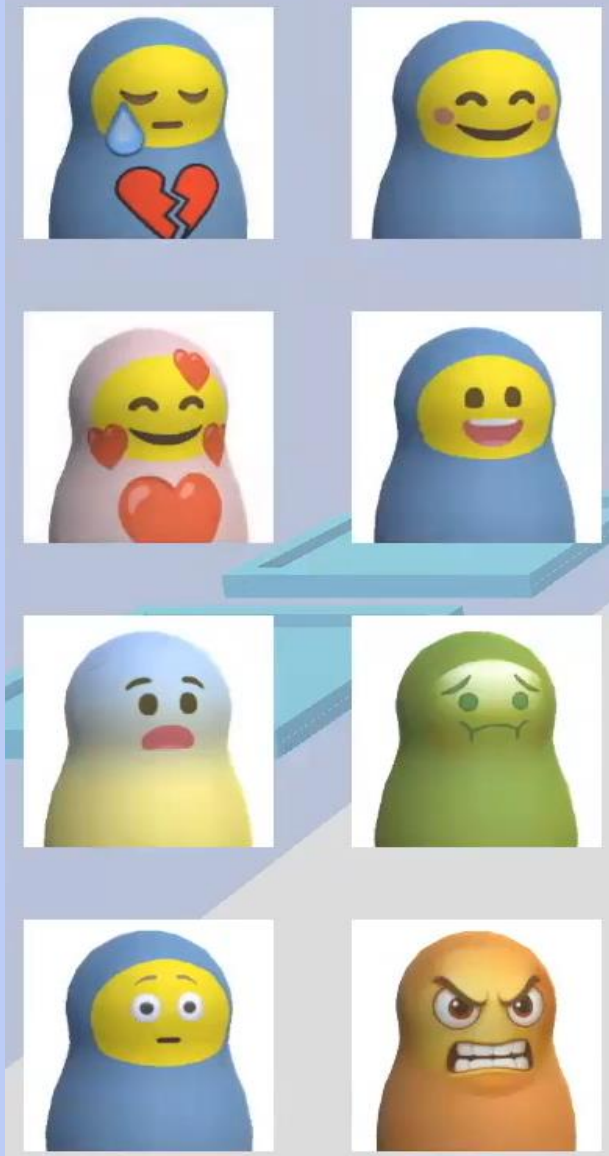
$\beta \alpha \theta \delta$

THE IMPORTANCE OF PLAY

"The therapist who can facilitate play is immediately rewarded with a strong connection to the client, one that colours the activity with a sense of trust and a positive attachment."

L Carey, *"Expressive & Creative Arts Methods for Trauma Survivors"*

BACK



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