

The Foundation of Connection for Healthy Neuropsychological Development

How has this been impacted by
COVID-19 safety measures and
how can these connections be
nurtured now?

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Human connections create neuronal connections – Daniel Siegal (1999)

- What does this mean?
- Attachment – John Bowlby
- Neurobiology – Allan Schore
- Polyvagal Theory – Stephen Porges



Attachment

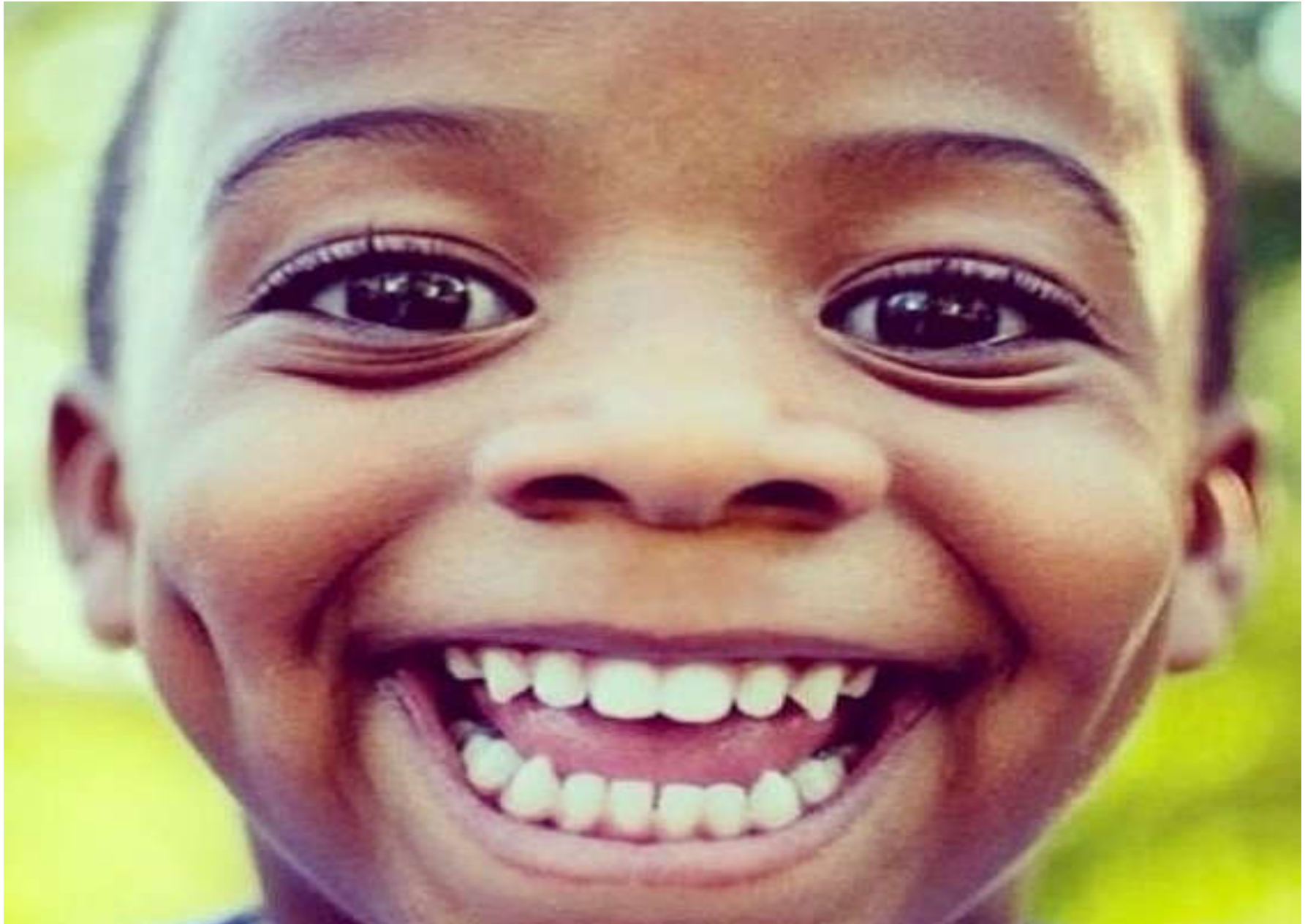
- It is our **biological imperative to be in a state of safety** through connection and co-regulation with another
 - Begins with the primary attachment relationship
- Through the **unconscious mechanisms** in the mind, one's body can be in a state of safety or in a state of defence
 - A state of **physiological and psychological safety provides a structure in the mind** which promotes health, growth, and restoration
 - A state of defence in the body is not conducive to social engagement
 - Explains the basis upon which the attachment relationships form

Attachment

- Need a caregiver for survival
- Provides physiological regulation and comfort
 - Leads to affect regulation
- This is a **co**-regulation
 - We do not survive without co-regulation
 - Initially non-verbal and face to face
 - First memory system
- Dyadic relationship regulates biological synchronicity
 - Develops reciprocal interactions fundamental for neurodevelopment







Autonomic Nervous System

- **Sympathetic system:** prepares the body to **expend energy to respond to environmental threats**
 - Once a threat is perceived a response is triggered accelerating heartrate, increasing breath rate, boosting blood flow to muscles, **fight/flight** response
- **Parasympathetic system:** maintains normal bodily functions and **conserves physical resources**
 - Once a threat has passed the system slows the heartrate, slows breathing, reduced blood flow to muscles, returns the body to a natural resting state, **rest/digest** response
- Our neural systems are integrated as a result of the maturation of regulatory systems
 - Sets up a growth facilitating environment



Neurodevelopment

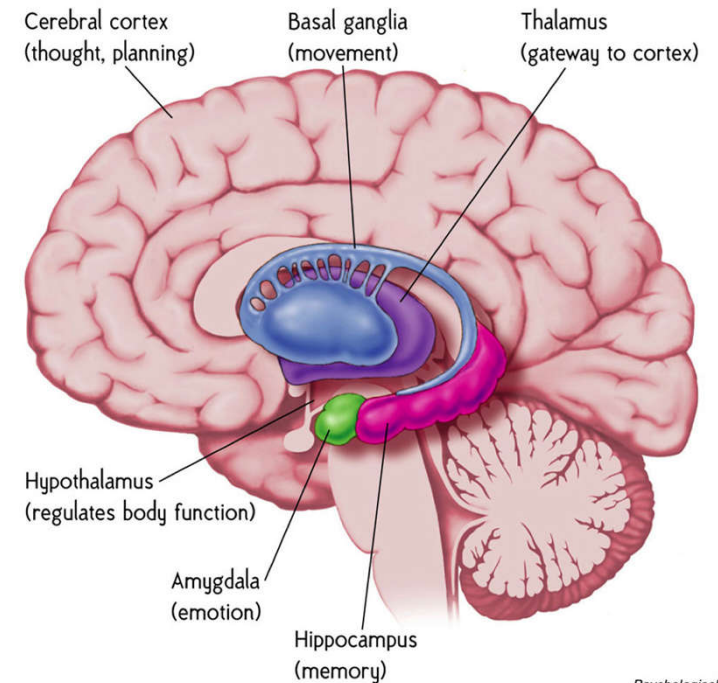
- **Reciprocal interaction** between the caregiver and infant modulates gene expression and neurocircuitry
 - Proliferation and pruning
 - **Regulatory function of social engagement allows for a physiological state** that promotes health, growth, and restoration
 - Increase of oxytocin and decrease in cortisol
- Oxytocin is critical in **sensory processing and multimodal integration in neurodevelopment**
 - Particularly face perception and emotional regulation – social cognition
 - **Fundamental for connection**
- Neurochemical environment **that facilitates structural development and stimulation in response to the environment**
 - Cortisol disrupts this process

Stress Response

- **Detection of a threat to safety** shifts the ANS from a state of calm to a state of defence
 - An increase in cortisol leads to hypervigilance to a **perceived threat**
 - A physiological reaction ensues
 - Fight, flight, freeze
 - Lower threshold of reactivity
- Neural regions facilitate downstream physiological responses
 - Amygdala controls the expression of fear related changes in sympathetic responses
 - **An overactive amygdala has an impact on the functioning of the hippocampus**

Hippocampal Formation

- Amygdala and hippocampus enable **learning, memory, and emotional responses**
 - The specialisation and differentiation of the temporal lobes will occur **in relationship** with environmental learning and stimulation
- The volume of hippocampal formations in the temporal lobe increases sharply until **two years old**
- Hippocampal formations in the **right hemisphere are significantly larger** in the right temporal lobe



Stress Response

- An increase in the levels of cortisol optimise biobehavioural states of defence
 - Evolutionarily **critical in order to survive**
- Only meant for **immediate and short-term survival**
 - Increased levels of cortisol over time leads to a **decrease in cognitive ability and physical health**
 - Our brains are designed to manage challenges **but violations of expectancy** become more difficult

Coping With Stress

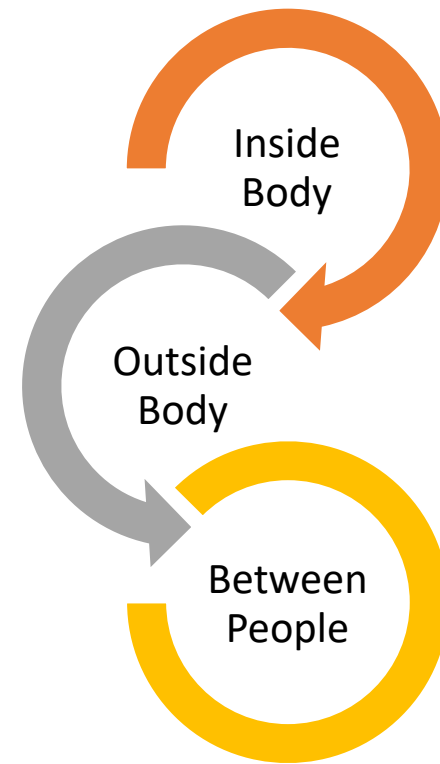
- In addition to neural regions involved in processing threat, our brain is also equipped with neural regions that process safety cues
 - From **our internal template that develops during attachment**
- Reciprocal cues **down regulate the response to stress**
 - Conveyed in **facial expressions** and **physiological comfort**
 - Regulation of the ANS occurs through **reciprocal interaction** with the other

COVID-19 Pandemic

- Pandemic is a **paradoxical challenge** to our nervous systems
 - Directly impacts upon our capacity to connect
 - We need to connect to co-regulate
 - Safety cues from facial expressions and sensory touch
- Policy requires **masks and social distancing** which results in the **isolation** of our nervous systems
 - Physically unsafe
 - Masks hide facial expressions and distort prosody of voice
 - Connection may be lethal
- NS is **simultaneously being challenged by incompatible demands**
 - Avoidance of contact
 - Fulfilling our biological imperative to connect with others to feel calm and safe

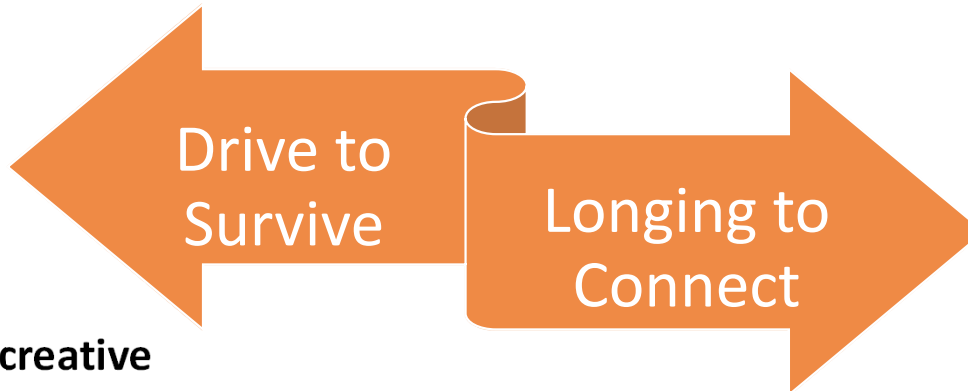
Re-Establishing Connection

- **Context**
 - Nervous system needs context to be reassured of safety
- **Choice**
 - Greatly reduced
 - Feeling of being trapped leads to an increase in stress response
- **Connection**
 - Feel safe enough in the body to connect with others
- **Bring awareness to these**
 - Mindfulness for necessity of danger and safety cues



Re-Establishing Connection

- **Unending and unpredictable** cues of danger
 - The world feels dangerous
 - Sympathetic response
- **Compassion interrupts the danger response**



- **Must be creative**

Re-Establishing Connection

- Goal is to **regulate the nervous system through the senses**
 - Grounding techniques
 - Prosody of voice
 - “Shall we”
 - Mindfulness
 - Moment when we can turn towards devices for connection
 - Not the thinking brain
- **Repetition of anchors**

