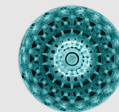


Self-Regulation from Foundations to Function: A Neurobiological Perspective

Presented by Amy Lewis, OTR/L
Heather Spann, OTR/L



Powerfully You



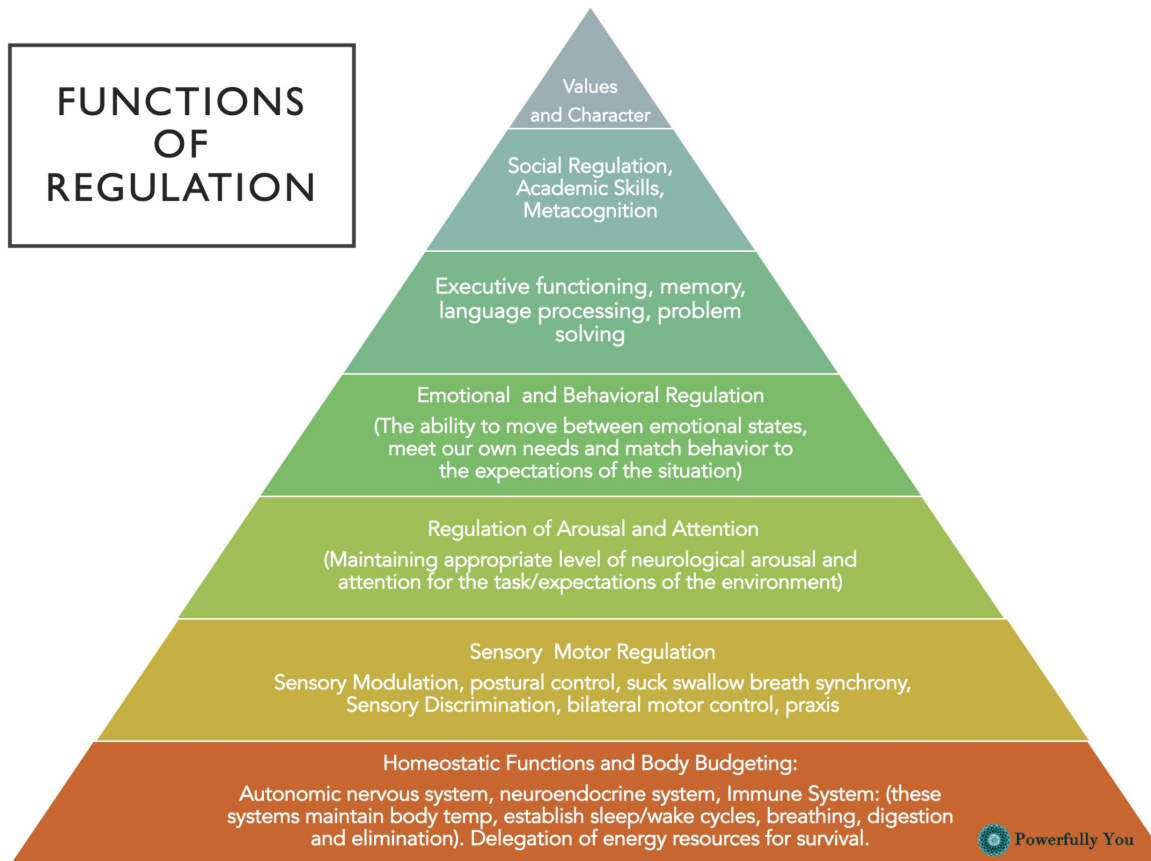
Participants will be able to:

- Identify self-regulation capacities occurring in distinct brain circuitry.
- Recognize interventions that are effective at each level of regulatory functioning.

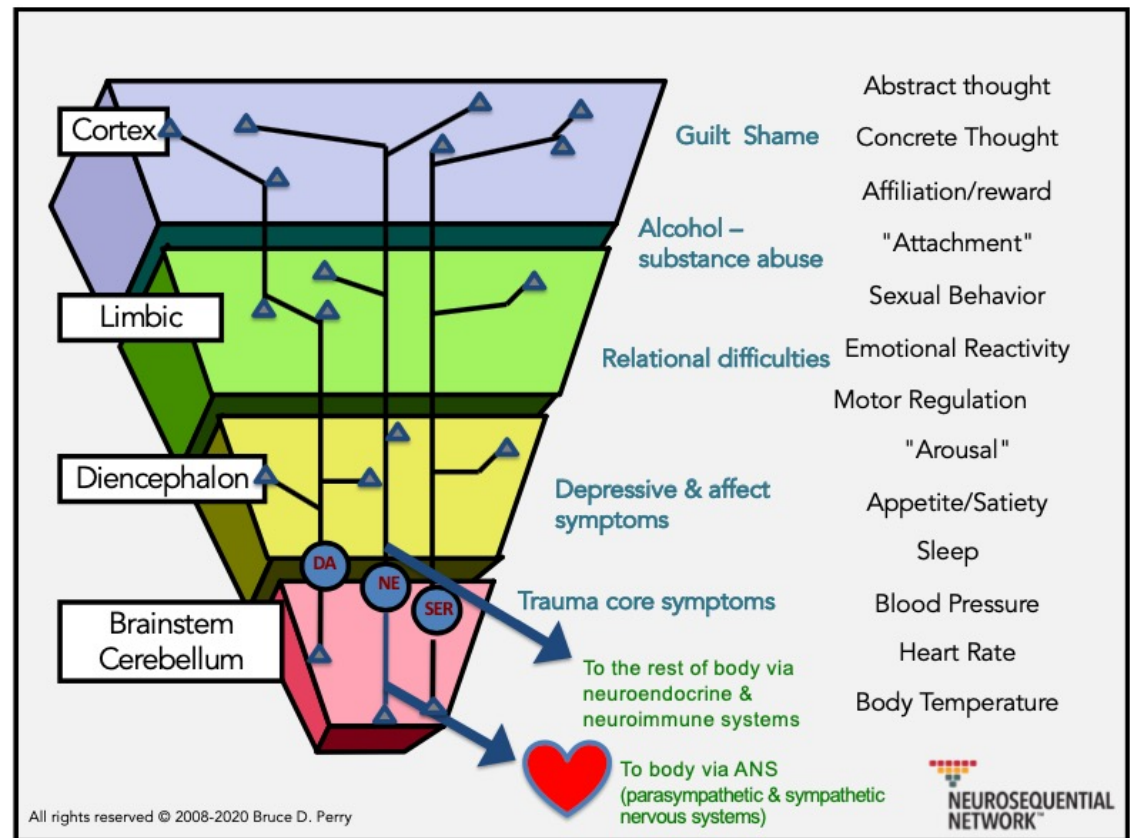
What is Self- regulation?

Self-Regulation is defined as the ability to adapt our neurological arousal, emotional state, motor activity, attention, and behavior to meet our own needs and the demands of the situation.

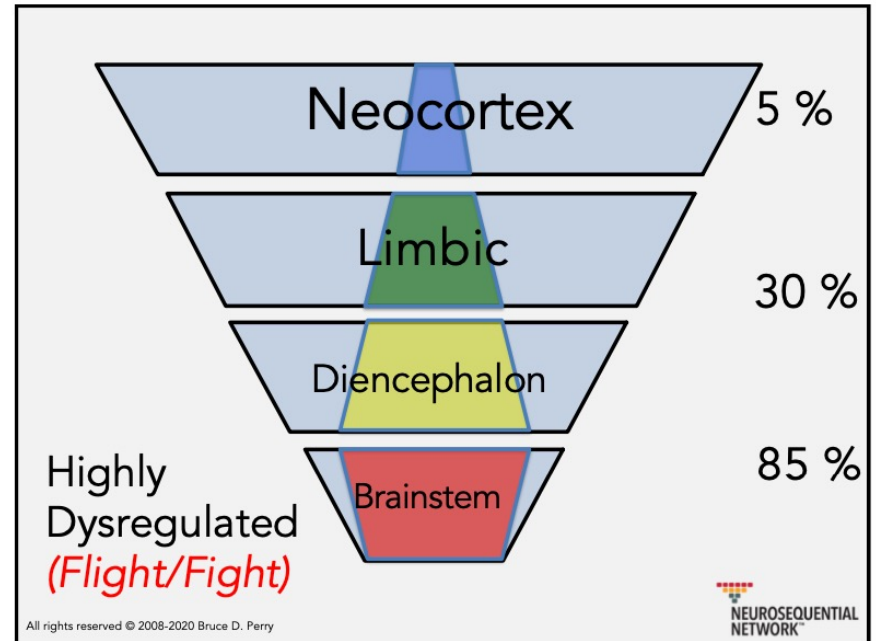
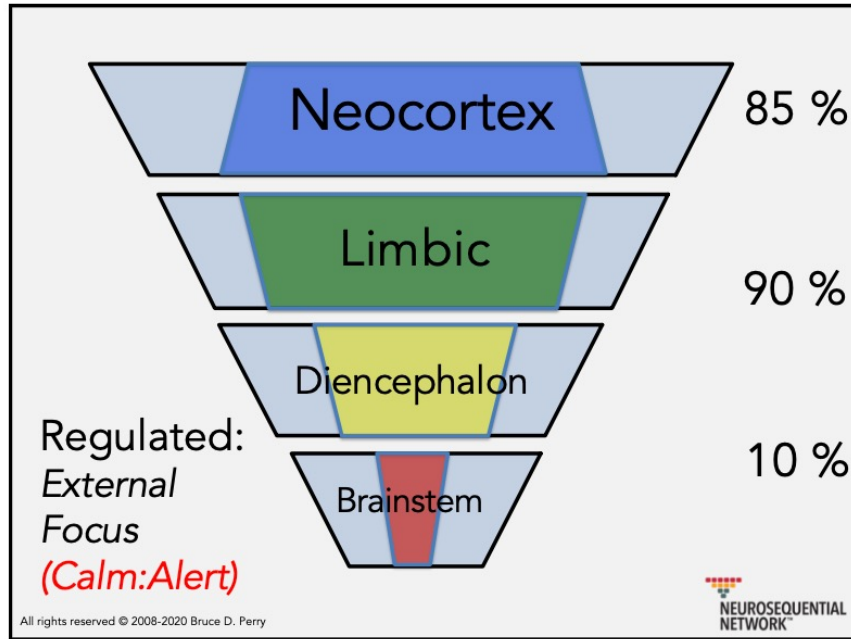
FUNCTIONS OF REGULATION



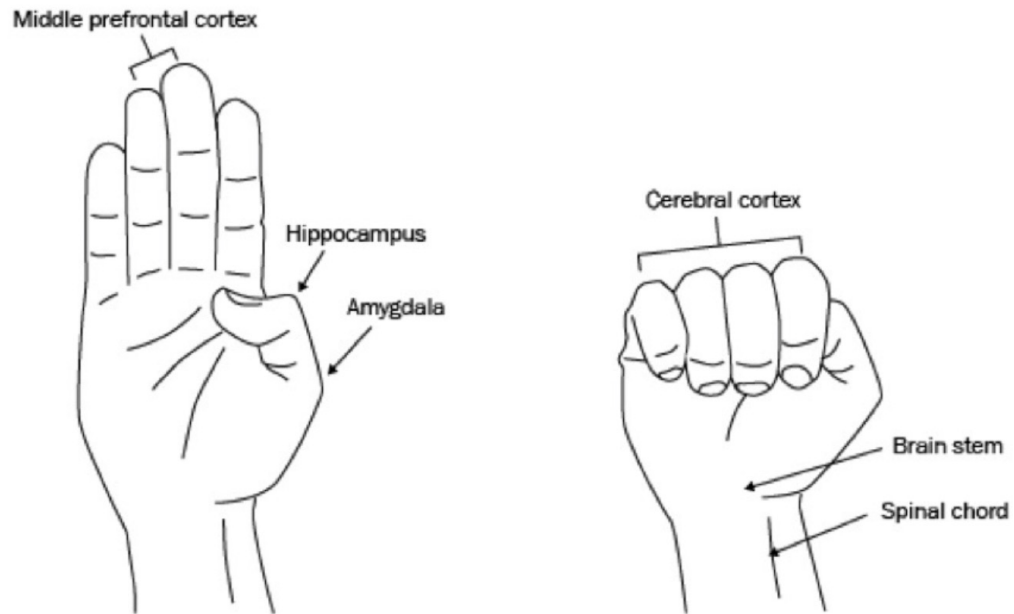
Where does regulation happen in the brain?



State Dependent Functioning



FLIP YOUR LID



Hand model courtesy of Dan Siegel



**“Self regulation is an
emergent capacity.”**

-Tracy Stackhouse

Other Regulation::

- Somatosensory soothing
- Relational
- Pharmaceutical

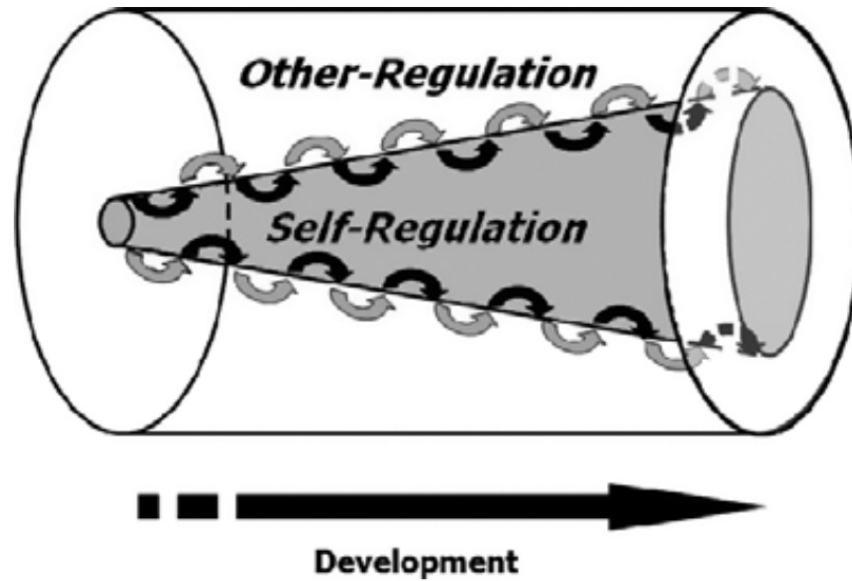


Figure 5. Transactional relations between self-regulation and other-regulation.

Addressing Self Regulation

Bottom-up-----Top-down

Bottom-up strategies MUST be used if a person is dysregulated and are helpful in facilitating learning even when regulated. Learning is ALWAYS achieved best in connection and safety.

Top-down strategies should only be used when the person is regulated. Regulation changes from moment to moment. Top-down learning is most effective when coupled with bottom-up strategies and in a connected relationship.

How we can support the emergence and development of self regulatory capacity from the bottom up

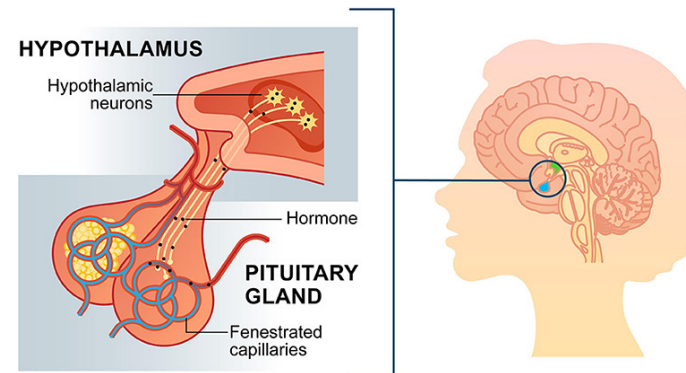
- Support physiological needs/homeostatic functions
- Create “Felt Safety”
- Provide connection through relationship
- Support using sensory and motor strategies

How we can support self-regulatory capacity using top-down strategies

- Mindful awareness/focused attention practices
- Explore sensorimotor tools
- Practicing Self Compassion

Physiological/Homeostatic Processes

Homeostasis is a foundational regulatory process that underlies all higher brain regulatory processes



Meeting physiological needs is one of the most important things we can do to enable a client to be regulated.

- Consider: sleep, nutrition, physical activity, stress vs connection



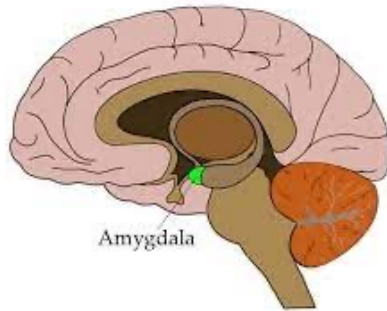
Additional resources to Explore the concept of body budget

For more information:

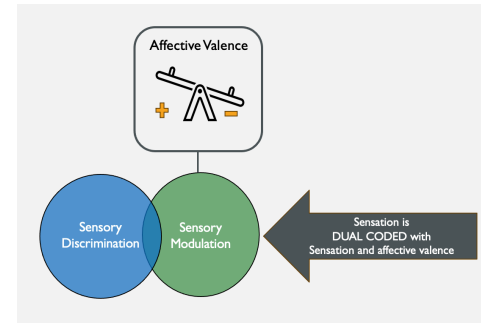
Body Budget concept as described by Lisa Feldman Barrett in *How Emotions Are Made*

<https://sequencewiz.org/2018/04/04/impact-of-daily-activities-on-body-budget/>

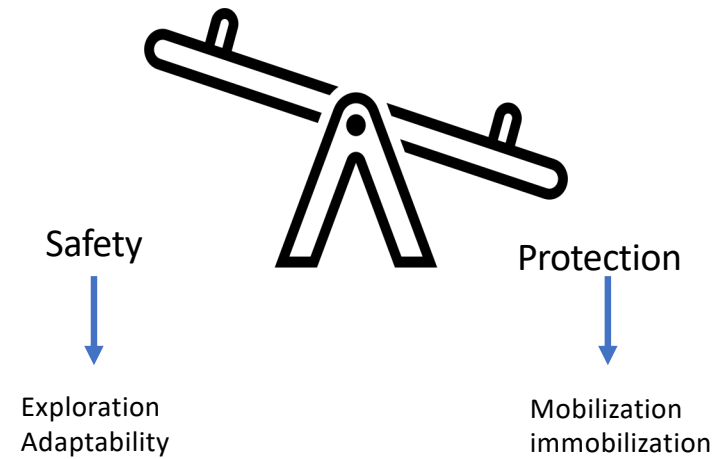
:
Affective coding



All sensory input is dual coded with sensation and affect.



Valence-based Safety Tipping Point Mechanism



Behavior Analysis Tool





Support regulation from the bottom up: Facilitating Felt Safety

- Use Attunement/Coregulation
- Consider:
 - Rhythmicity
 - Breath
 - Suck/swallow/breathe synchrony
 - Postural control and alignment
 - Muscle tension
 - Primitive movement patterns
 - Sensory integrative processing- modulation and discrimination
- Use connection strategies



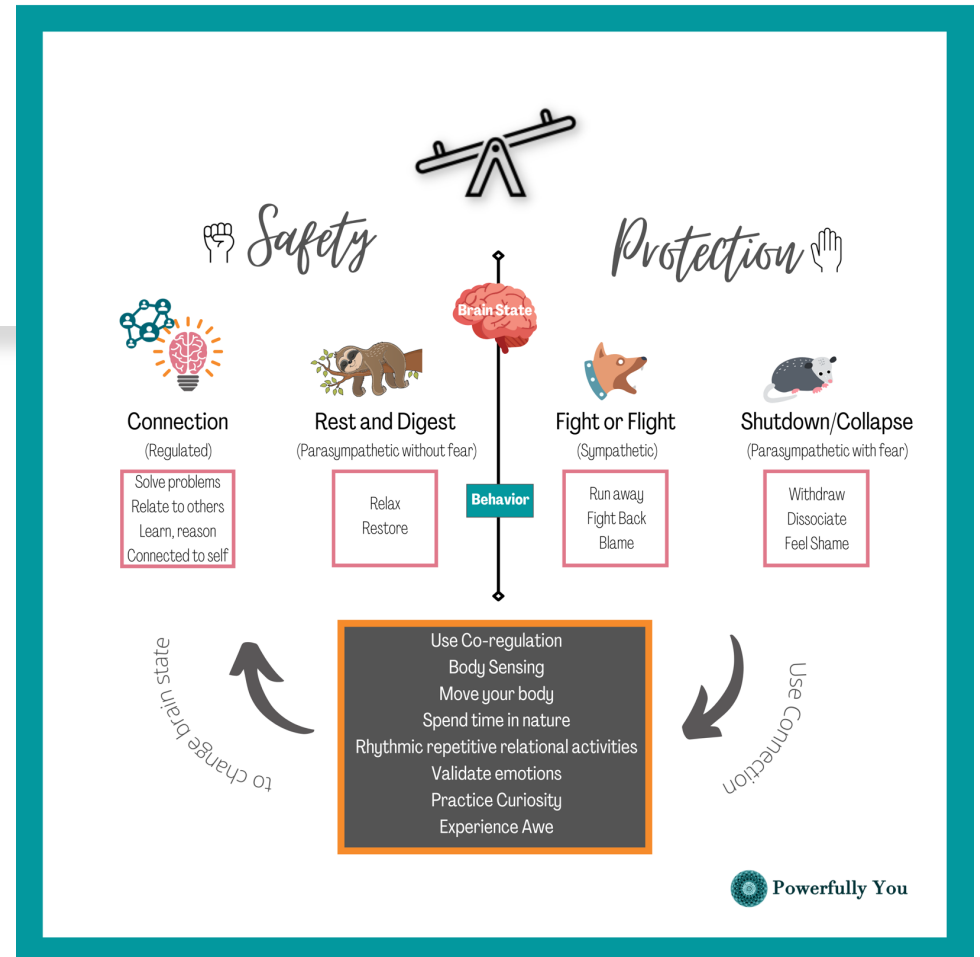
Support regulation from the bottom up:

Connection

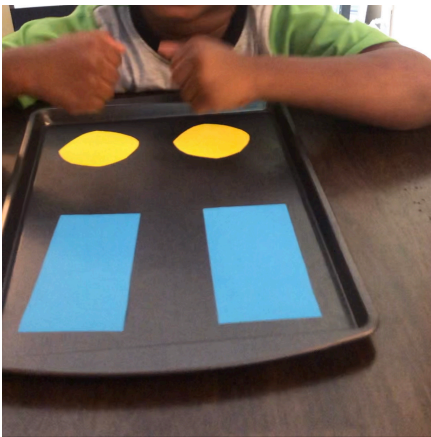


- Humans are designed for connection
- Self regulation develops in connection
- We internalize the regulation of another person when we are co regulated reliably
- Rhythmic repetitive relational activities are a way we can facilitate regulation
- Maintaining our own regulation and connection to ourselves allows us to be connected to others
- Being present and authentic facilitates connection
- Keeping a lens of curiosity, compassion, and non-judgment facilitates connection

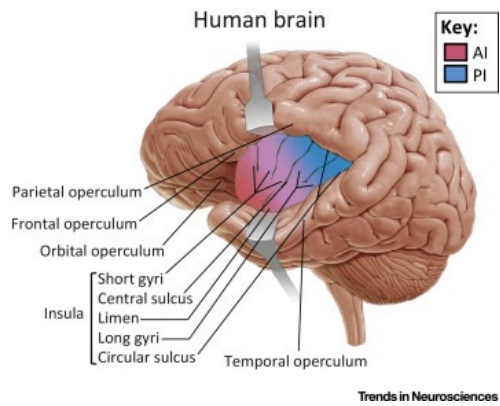
Connection Graphic



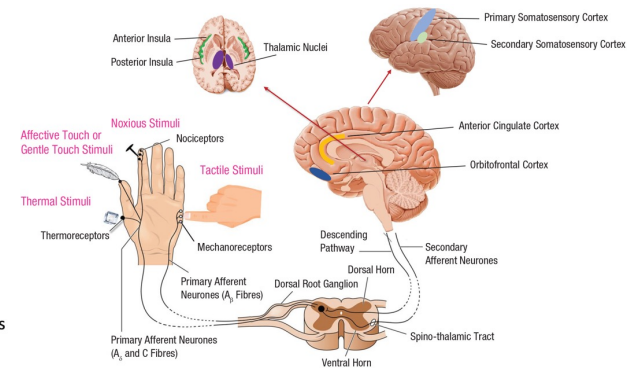
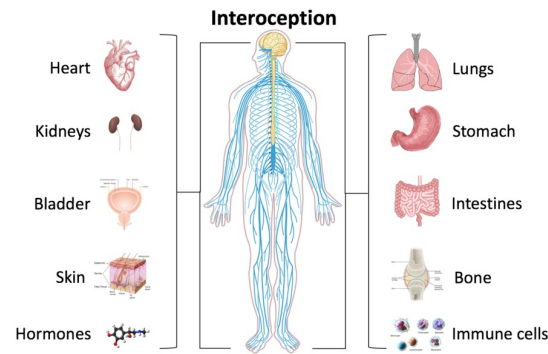
Connection activities



Interoception



Interoception - the “process of how the nervous system senses, interprets, and integrates signals originating from within the body” (Quigley et al., 2021, p.29)

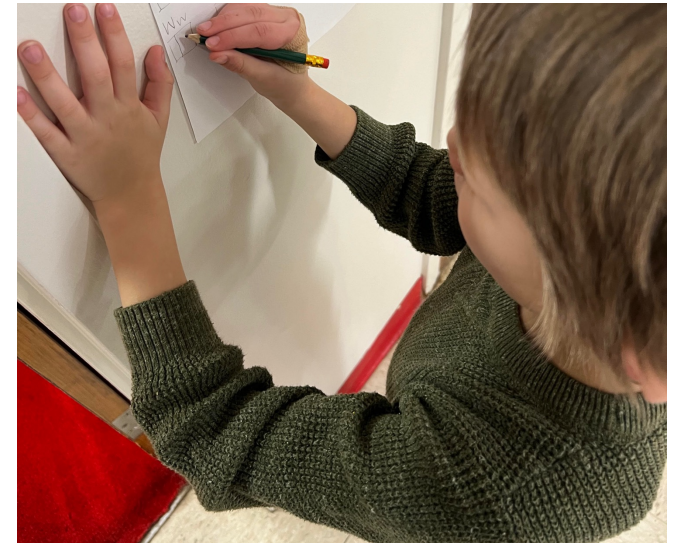
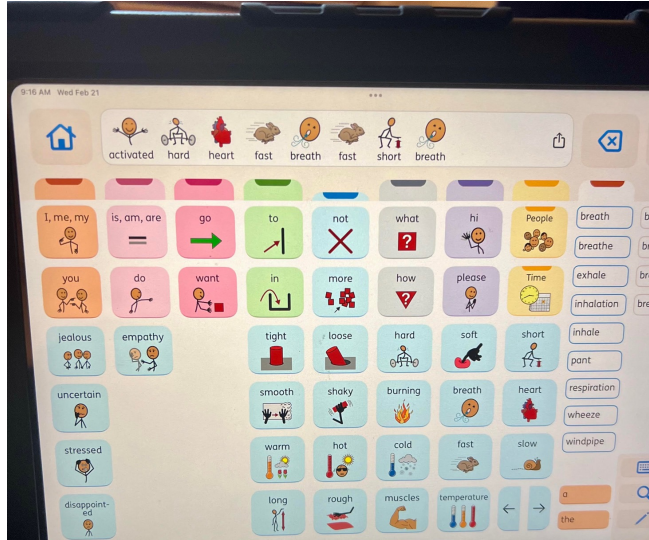


Interoception Interventions: Bottom-up vs top-down

Interoceptive awareness activities



Felt safety



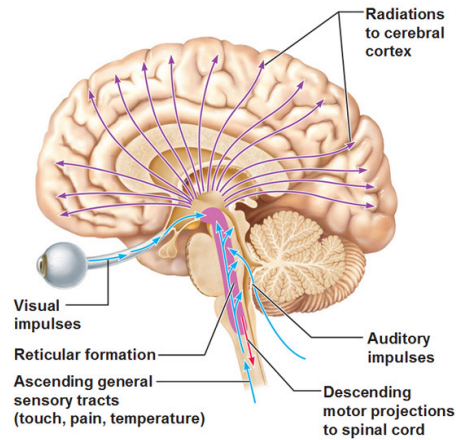


Interoception resources

- Interoception: A Multi-Sensory Foundation of Participation in Daily Life. Schmitt,C, Schoen, S. (2022) Frontiers in Neuroscience.
- https://insighttimer.com/cassandracarlopio/guided-meditations/body-scan-64?_branch_match_id=1208069828642103397&utm_campaign=web-share&_branch_referrer=H4sIAAAAAAAAAAA8soKSkottLXz8wrzkzXyyjRDws0LfDPTYsISk8CAMCIxRAcAAAA

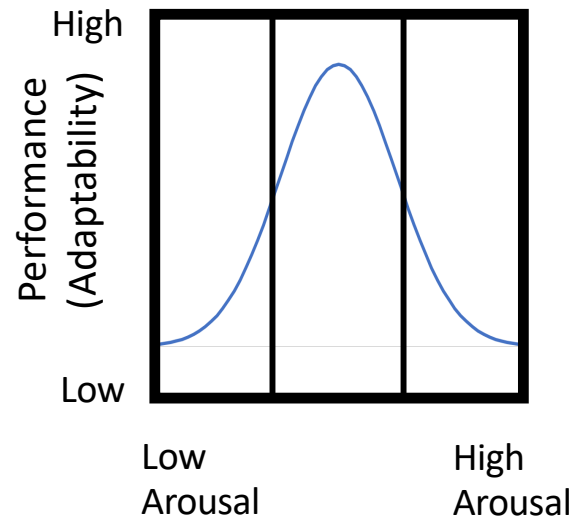
Arousal/Activation

The Reticular Formation



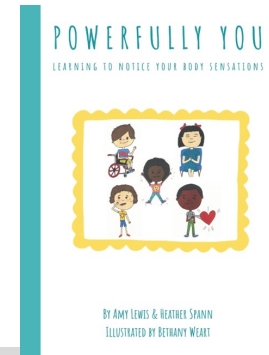
- **Arousal- Energy of activation in the body and brain that enables us to meet the demands of the situation.**
- When we adjust our arousal we can upregulate or downregulate our state to meet the demands of the situation. This is a bottom up intervention when we provide the input.

Yerkes-Dodson Principle

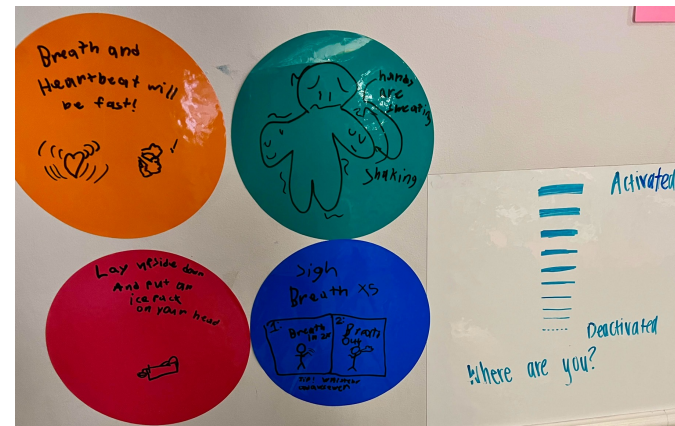


“The relationship between arousal and performance follows an inverted U-shape, where only medium levels of arousal provide suitable conditions and overarousal, as well as underarousal, interferes with performance particularly in complex tasks. “

Building awareness of Activation



- Take about 20 seconds to notice your muscle tension, your heartrate, your breath, and your temperature.
- Notice how it changes over the day.

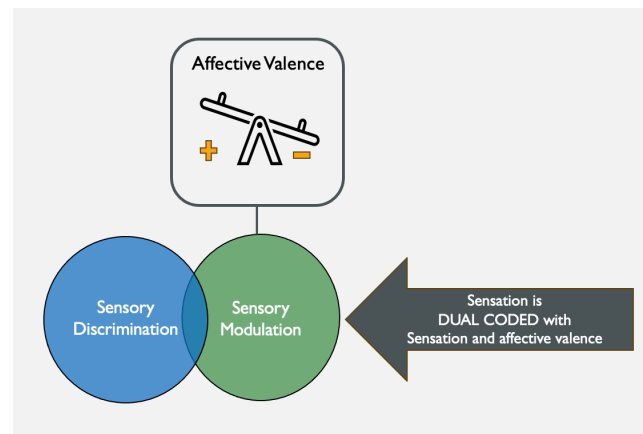


Sensory and Motor Based Tools



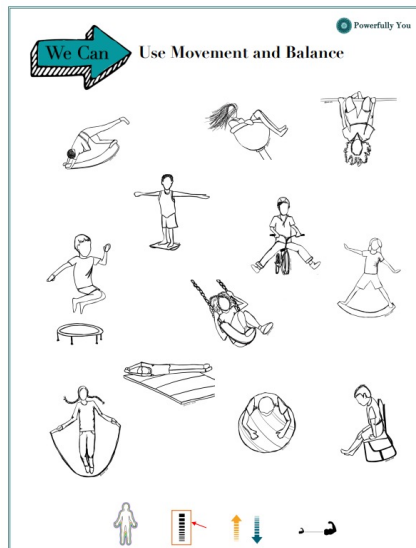
Sensorimotor tools can be used to help upregulate and downregulate the nervous system

- When this input is provided by another person (such as rocking and swaddling and infant) it would be considered to be “other regulation” and would be a bottom up intervention. When we internalize strategies and can use them independently is considered “self-regulating”.
- We can teach self regulation strategies IF a child is regulated enough to participate and has enough awareness to understand what works for them

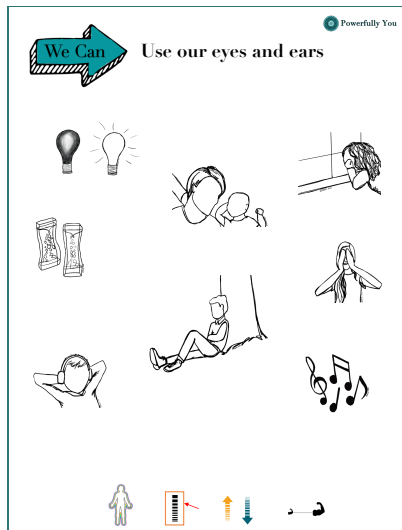


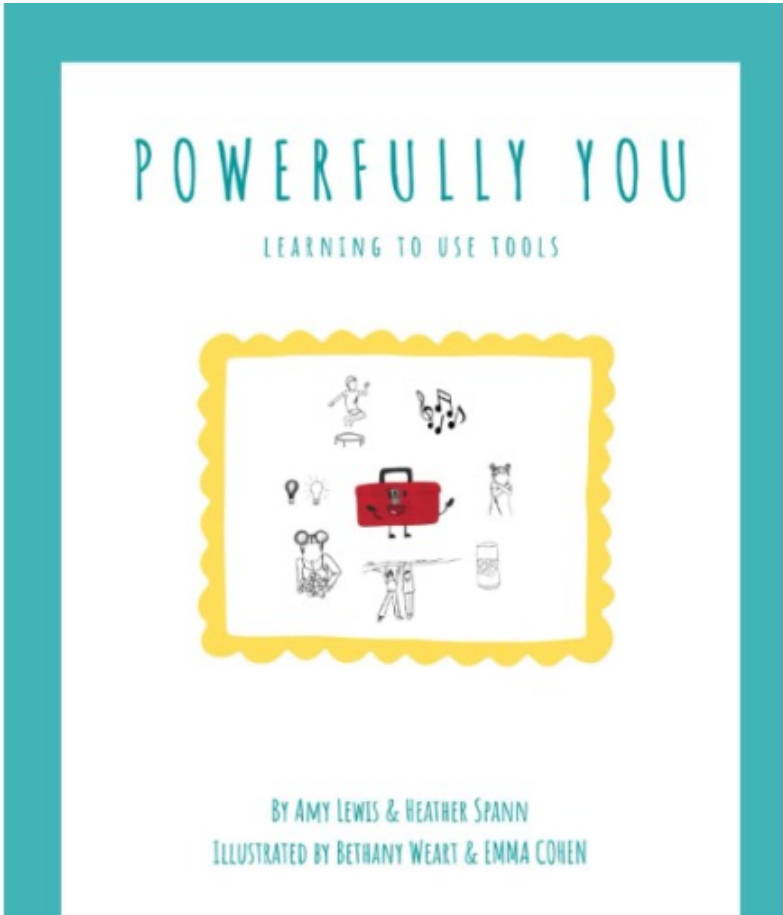
Because of dual coding we have to consider not only the input provided, but also the affective valence of the sensory experience for and individual.

Sensory and Motor Based Tools



Sensory and Motor Based Tools





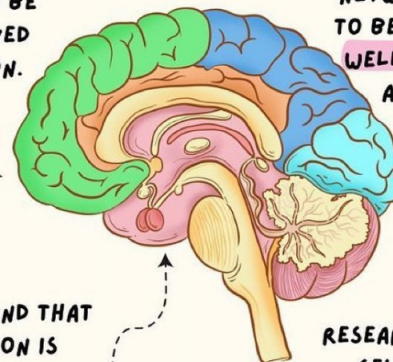
Self Compassion

Compassion embodies a tangible expression of love for those who are suffering. Self compassion is noticing our own experience of suffering and being able to express love for ourselves, even if we have made a mistake.

EFFECTS OF SELF COMPASSION ON THE BRAIN

RESEARCH HAS FOUND THAT SELF-COMPASSION IS ASSOCIATED WITH INCREASED ACTIVITY IN THE PREFRONTAL CORTEX, WHICH MAY BE RELATED TO IMPROVED COGNITIVE FUNCTION.

RESEARCH HAS FOUND THAT SELF-COMPASSION IS ASSOCIATED WITH INCREASED ACTIVITY IN THE DEFAULT MODE NETWORK, WHICH IS THOUGHT TO BE RELATED TO A SENSE OF WELL-BEING AND A GREATER ABILITY TO REGULATE EMOTIONS.



RESEARCH HAS FOUND THAT SELF-COMPASSION IS ASSOCIATED WITH INCREASED ACTIVITY IN THE VENTRAL STRIATUM WHICH MAY BE RELATED TO INCREASED MOTIVATION TO THE ABILITY TO MAKE POSITIVE CHANGES IN ONE'S LIFE.

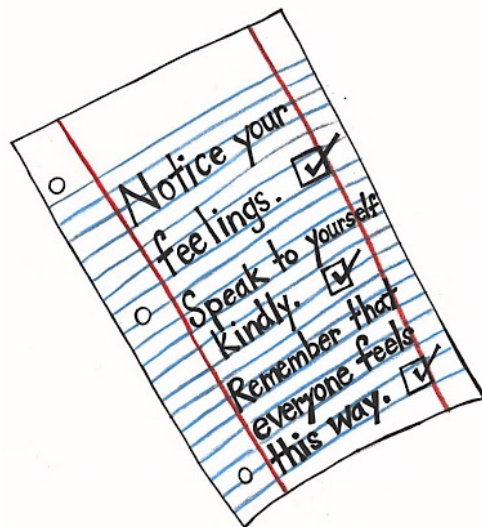
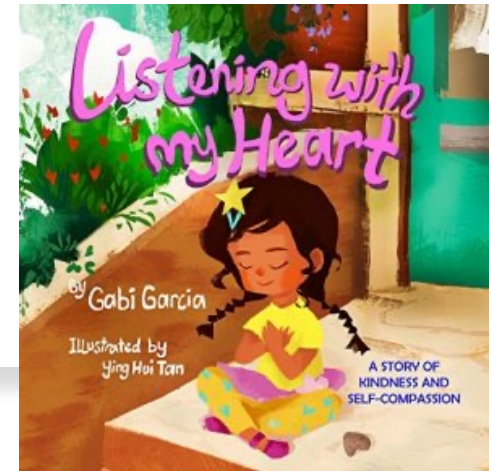
RESEARCH HAS FOUND THAT SELF-COMPASSION IS ASSOCIATED WITH INCREASED ACTIVITY IN ANTERIOR REGIONS, WHICH MAY BE RELATED TO INCREASED ABILITY TO EMPATHIZE WITH ONESELF AND REGULATE EMOTIONS.

@positive_regard_for_you



Powerfully You

Self Compassion Ideas



Practice self compassion: 3 steps

1. Mindful awareness
2. Self-kindness
3. Common humanity

Test your self compassion:

<https://self-compassion.org/self-compassion-test/>