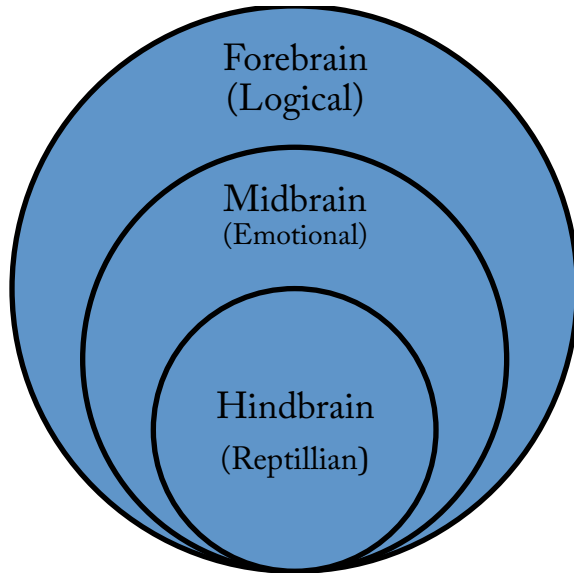


Trauma Physiology

Week 2 Summary and References Sheet

Overview of the Brain

- The brain can be simply categorized into three layers, all with distinct functions relevant to the processing of danger and trauma:



Hindbrain: Also known as the reptilian brain, the hindbrain deals with all of the essential functions like breathing, using the bathroom for infants, and the heart beating and blood pumping (i.e., processes you don't need to think of).

Midbrain: Also known as the emotional brain, this part of the brain contains the limbic system (amygdala, hippocampus, hypothalamus, among others) and assesses danger.

Forebrain: Also known as the logical brain, this is the most recent part of the brain from an evolutionary perspective and controls functions such as thinking, language, abstract reasoning, and executive function.

The Brain and Trauma

- When someone is NOT in danger, communication between the midbrain and forebrain is relatively stable; i.e., a person's executive function and rational brain is in tact.
- When someone is in danger and highly triggered (i.e., high potential to be traumatized), the thinking brain shuts down and communication between the forebrain and rest of the interpretive centers ceases to exist. Once the amygdala and rest of the limbic system assess danger, the hypothalamus sends a message via the hindbrain and the body goes into, fight, flight, or freeze modes (see below). Think of the top layers of the brain continuously shutting down and the body taking over. This process is known as *down regulation*.

Critical Point from Trauma and the Brain Lessons

Individuals who are traumatized have the potential to misinterpret neutral and non-dangerous stimuli as dangerous. This is critical to understand when viewing youths' behavior via a trauma-informed lens.

Fight, Flight, and Freeze

- The fight, flight, freeze, and feigned death responses are somatic reactions that take effect as the brain down regulates when in an extremely threatening or dangerous situation.
- Mobilizing defenses (fight, flight, and in part freeze) activate the sympathetic nervous system and readies the body to mobilize, while immobilizing defense systems shut the body down from the inside (e.g., feigned death, to some extent freeze type 2).

Fight

- Mobilized defense, stays at the scene and fights.
- As an adaptation (conditioned over time; week 3 material) this can manifest as anger, rage, confrontation, when youth is triggered.

Flight

- Mobilized defense, but individual is compelled to flee scene.
- As an adaptation can manifest as fear, anxiety, conflict avoidance when youth is triggered.

Freeze

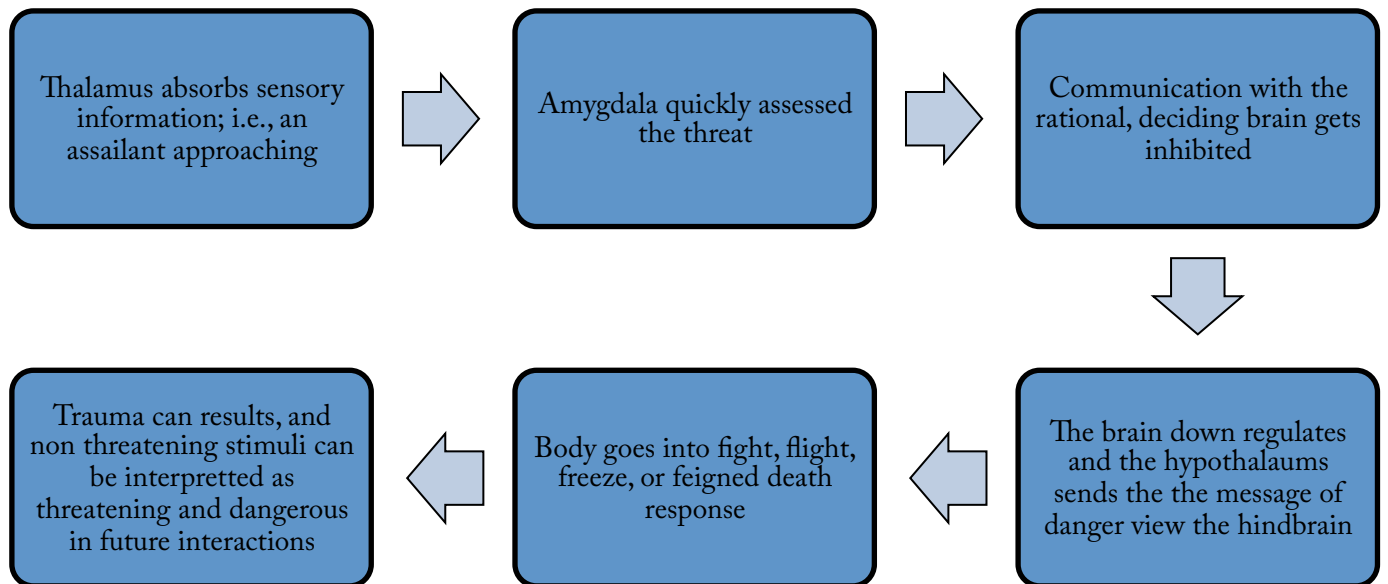
- Type 1: Hyper-aroused, ready to flee on at the blink of an eye (Mobilizing defense)
- Type 2: Activated and tense but cannot flee, is frozen (Immobilizing defense).

Feigned Death

- Immobilizing defense where body shuts down, hypo-arousal), goes numb, and can (before the point of death if in that dangerous of a situation) release endorphins that reduce pain.
- Can manifest as an adaptation as non-aggressive movements, crouching down, automatic compliance.

(Continue to next page)

The Brain and Body In Tandem When Interpreting Trauma



Key References from Trauma Physiology Lessons

Porges, S. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. New York, NY: Norton.

Ogden, P. (2006). *Trauma and the body: A sensorimotor approach to psychotherapy*. New York, NY: Norton.

Van Der Kolk, B. (2014). *The body keeps the score: Brain, mind, and body in the healing of trauma*. New York, NY: Viking.

[Brief Overview of Trauma and the Brain Via Blog Post on the Center for Adolescent Studies Website](#)

Himmelstein, S. (2016). *Trauma and the brain: An introduction for professionals working with teens* (<http://centerforadolescentstudies.com/trauma-and-brain/>)