Trauma & the Body: Mapping Autonomic Responses for Assessment and Intervention in Mental Health

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at

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CENTER FOR PROFESSIONAL DEVELOPMENT
Learning Objectives

• Learn how to better navigate through your client’s PTSD by developing an overarching, coherent understanding of post traumatic stress

• Understanding the memory systems involved in PTSD

• Be able to map the 5 major autonomic nervous system states associated with stress and trauma
Level of Evidence

Etiology:
• Underpinnings based in memory systems and biological response to threat (autonomic nervous system) research, literature is well established in these areas

Theoretical model:
• Has not been falsified in 40 years, continues to explain more current research findings

Clinical:
• No modalities built off of this theoretical model have received the evidence based designation (somatic modalities not part of mainstream funding and research)
• Partially validated with a successful yet uncontrolled pilot study conducted in partnership with CU Denver
• Thousands of anecdotal cases that appear to validate theoretical model
• Ultimately, research shows early, positive results. Evidence and validity however are limited based on limited research trials.
Imagine a plane flying low over a city and buildings
What did you have for lunch a week ago today?
Episodic Memory

- Captures significant events in a timeless state (positive or negative)
- Different pathway for encoding and storing memories
- Stored as primarily an experiential and visceral “snapshot” of the event
- Can be accessed through verbal means but is fundamentally an image or experience, may or may not be conscious
- Leads to creation of triggers: elements of the event (diesel fuel for vets) calls forth the entire memory and consequent reactivity
- Primary memory system involved in stress and trauma reactions
- Primarily responsible for relapse

Procedural Memory

- Memory of processes (tie your shoelace, play a musical instrument, language, character, boundaries)
- Non-conscious
- Non-verbal
- Requires time and repetition to learn, time and repetition to unlearn
- 90% to 95% of character is procedural in nature
- Coping mechanisms, self care, self soothing (or lack of self soothing), attachment style, relapse are all procedurally learned processes

Semantic Memory

- Context free factual information
- Verbal
- Analytic process
- Explicit / conscious memory

Memory Systems & Personality

Self-observational capacity
Executive function

Semantic (declarative)
Episodic: (declarative)

Procedural (non-declarative)

Trauma Accessed Through Non-declarative Memory

Research into the nature of traumatic memories indicates that trauma interferes with declarative memory (i.e., conscious recall of experience) but does not inhibit implicit, or non-declarative memory, the memory system that controls conditioned emotional responses, skills and habits, and sensorimotor sensations related to experience.

**Semantic Memory:** Talk therapies, insight and self awareness, step work, life coaching, cognitive therapy

**Episodic Memory:** Accessed via sensation, emotion (autonomic nervous system), experiential therapies (Gestalt), somatic therapies, exposure therapies

**Procedural Memory:** Behavioral approaches, DBT skill development, 90 meetings, 90 days, sponsorship, meditation, self regulation skills

**Right Tool for Right Job**

Stress & trauma are a bottom up processes occurring in mostly non-verbal, experiential memory systems.
Sensorimotor impulses and nervous system responses are part of episodic memory.

When episodic memory is triggered, sensations and impulses that were part of a past event will feel like symptoms (anxiety, tension, fear, irritation, depression, hopelessness, numbness) in the present moment.
What is the autonomic nervous system?
The automatic nervous system (ANS) governs many body processes such as:

- heart rate
- breathing
- metabolism
- temperature

Two sub-branches:
- sympathetic (fight/flight)
- parasympathetic (sleep, calm, depressive, dissociation)
All mammals share the same basic autonomic nervous system.

Mapping the Autonomic Nervous System

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Stress symptoms are adaptive survival responses to threats
Threat

= 

Activation of the ANS

The greater the threat, the greater the ANS response
Marble Metaphor

• Think of your nervous system as a marble on a track that is being acted on by gravity.

• ANS activation is a state of tension and requires biological energy to maintain.

• The marble seeks the most stable, relaxed, and efficient position possible.
• The ANS can retain activation even when the threat has passed.

• This is due to attractor states or "resting places" built into the ANS.
State 1: Mild Stress

- Relatively stable
- Attracts and holds the marble
State 1 - Mild Stress
Adaptive ANS responses / symptoms:

- Increased energy
- Fear
- Anxiety
- Anger
- Hyper-alertness
- Excitement
- Irritability / annoyance
- Increased heart rate and breath speed

- Insomnia
- Somatic Tension: tight muscles, headache or other pain, sensations of heat
- Restlessness or feeling fidgety
- Speedy thoughts
- Feeling Nervous
State 1: Mild Stress

- Relatively stable
- Attracts and holds the marble

State 1: Mild Stress
State 2: High Stress

- Maximum activation and performance
- Short-duration
- Unstable
State 2 Symptoms – High Stress:
Adaptive ANS responses / symptoms Include:

- Panic
- Hyperventilation
- Heart Racing
- Sweating
- Shaking, trembling
- Overall body tension: muscles contracting

- Rage
- Terror
- Maximum performance
- Very fast thoughts
- Doesn’t last very long
State 2: High Stress

- Maximum activation and performance
- Short-duration
- Unstable
Stress versus Trauma

Everything we have covered so far is stress – Not trauma.

Stress = Activation in the Fight or Flight, Sympathetic branch of the Autonomic Nervous System
Trauma Emerges

- Trauma emerges with overwhelm of the sympathetic system. When active fight, flight responses fail to resolve the threat (i.e. when active solutions fail) passive solutions are engaged.

- A massive parasympathetic response emerges.

- Your body starts to shut down, dissociative responses emerge, fragmentation of the psyche
State 3: Moderate Trauma

Threat Level

Overwhelm point
Stress-induced analgesia has been described in experimental animals after a variety of inescapable stressors such as electric shock, fighting, starvation, and cold water swim. In severely stressed animals opiate withdrawal symptoms can be produced either by termination of the stress or by naloxone injections.

2 decades after the original trauma, opioid-mediated analgesia developed in subjects with PTSD in response to a stimulus resembling the traumatic stressor, which we correlated with a secretion of endogenous opioids equivalent to 8 mg of morphine.

State 3 Moderate Trauma
Adaptive ANS Responses / Symptoms include:

- Lethargy
- Depression
- Sleepiness
- Heaviness
- Collapsed posture
- Lessening muscle tension
- Fogginess / Dissociation
- Sensations of heavy weight
- Feeling cold
- Nausea
- Confusion
- Slow Thoughts
- Suicidality
- Hopelessness

Alternate or occur simultaneously with State 1 & 2 symptoms
The Difference between Moderate and Severe Trauma:

A possible solution that didn’t work (state 3) versus absence of a solution (state 4)
State 4: Severe Trauma
State 4 Severe Trauma
Adaptive ANS Responses / Symptoms:

- Blank affect
- Numbness
- Feeling disconnected
- Spaciness
- Vision changes: clouded or tunnel
- Feelings of unreality
- Most dissociated state
- Out of body experiences
- Floaty
- Respite

Absence of State 1 & 2 Symptoms
A solution based understanding of trauma:

- the presence or absence of solution determines which ANS state we went to during the actual event
- solution also determines a great deal about how we process trauma now
Bimodal Nature of Trauma

...A vast literature on combat trauma, crimes, rape, kidnapping, natural disasters, accidents, and imprisonment has shown that the trauma response is bimodal: hypermnesia, hyper-reactivity to stimuli, and traumatic re-experiencing coexist with psychic numbing, avoidance, amnesia, and anhedonia. These responses to extreme experiences are so consistent across the different forms of traumatic stimuli that this bimodal reaction appears to be the normative response to any overwhelming and uncontrollable experience.

Clinical Observation on Dual Activation & Bipolar Diagnosis

• State 3 (dual activation, hot and cold cycles) can be misdiagnosed as bipolar disorder.

• The problem: inhibiting symptoms prevents resolution.
References


Gellhorn E: (1957) Autonomic Imbalance and the Hypothalamus, Minneapolis: U of Minnesota Press


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