

FROM BRAIN TO BEHAVIOR – HOW CAN WE HELP IN A CRISIS?

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OBJECTIVES

- ▶ Understand what occurs in the brain when a crisis event happens.
- ▶ Participants will learn the influence of prolonged crisis or trauma on the brain.
- ▶ Participants will learn supportive responses to the client's in specific types of crisis.

BRAIN BASICS

- ▶ Why is it important to talk about what happens in the brain during a crisis?
- ▶ There are parts of the brain that help us to survive and subsequently then make sense of what is happening to us.
- ▶ For many, response to crisis will dissipate without any intervention.
- ▶ For others, the event may influence a prolonged resolution or even lead to a mental health disorder.
- ▶ Sometimes it can be helpful to let our clients know that what is happening is not unusual.

HEAVY HITTERS

- ▶ What parts of the brain are important?
 - ▶ Five senses
 - ▶ Thalamus
 - ▶ Hypothalamus
 - ▶ Amygdala
 - ▶ Hippocampus

THE SENSES

- ▶ We take in information about the world through our eyes, ears, noses, hands, skin, etc.
- ▶ How does that effect the brain?
- ▶ How do we make judgments on this?
 - ▶ i.e., what's a crisis and what's not?
- ▶ It's the first step...

THALAMUS

- ▶ Makes judgments on whether the stimulus is threatening or not.
- ▶ Critical in crisis as the relay system for sensory information on its way to the cortex.
- ▶ If the stimuli is not threatening, then the information is processed and coded in our explicit memory so that we can categorize it and recall it later.

- ▶ If the stimuli IS perceived as threatening....
- ▶ The thalamus sends the information to the amygdala and the emotions are heightened as well as the physical reactions.
 - ▶ Our cognitive processes are overridden at this point!
 - ▶ No need to make sense of threatening stimuli if we are trying to survive.
- ▶ Our emotional and physical reactions are scattered and do not make sense at this point.
 - ▶ It means our amygdala (limbic system) has taken over from the hippocampus (which helps us encode and store information in our memory)

HYPOTHALAMUS

- ▶ When the limbic system 'kicks in' during a crisis it delivers the information directly to the hypothalamus.
- ▶ This means we bypass consciousness and things happen without our permission or realization. (Dietz, 1992)
- ▶ The hypothalamus is also important as part of the HPA axis.
 - ▶ Hypothalamus → Pituitary gland → Adrenal glands

ANS, SNS, & PNS

- ▶ ANS = autonomic nervous system
 - ▶ Comprised of the SNS (sympathetic nervous system) & PNS (parasympathetic nervous system)
- ▶ SNS is meant to mobilize body's resources in threatening or stressful situations.
 - ▶ Signals the adrenal glands to release epinephrine and norepinephrine that prepare body to respond to a threat.
 - ▶ Increase heart rate & BP, accelerate respiration, prepare muscles for action.
- ▶ PNS turns “off” the body's activation.

HPA AXIS

- ▶ Functions in 'normal' reactions to threat as well as an 'abnormal'
- ▶ Essentially involves the amygdala signaling an alarm of threat or non threat to the hypothalamus.
- ▶ Then to the SNS & CRF
- ▶ From there the adrenal glands become involved
- ▶ This triggers our epinephrine and norepinephrine
- ▶ AND cortisol.

CORTISOL

- ▶ Stress hormone (hydrocortizone)
- ▶ Meant to inhibit or halt the alarm reaction.
- ▶ In other words – in crisis, cortisol is released to help us calm down.

BUT....

- ▶ What happens if we have had changes in our brain or have been exposed to multiple crises and trauma.
- ▶ In those who have PTSD or symptoms of PTSD, the adrenal glands do not release enough cortisol to inhibit the fight/flight/freeze reactions.
 - ▶ Thus the person with PTSD may continually believe they are in crisis = hyperarousal.

RESPONSES

- ▶ Fight, flight, freeze, or submit
- ▶ Each associated with neurophysiological response
- ▶ FIGHT = high arousal response, activation of SNS & HPA axis; anxiety and rage; approach threat.
- ▶ FLIGHT = SNS & neuroendocrine implicated here; physiological response similar to fight (need to move), but the emotions are anxiety and fear.; avoid threat.
- ▶ FREEZE = activation of both SNS & PNS. Bodies are highly activated and are aware of threat, but body remains immobile while deciding what to do – all the while taking in information about the threat.
- ▶ SUBMIT = shut down the body's active defense or DISSOCIATE.

SUBMIT OR DISSOCIATE

- ▶ During this response, a primitive unmyelinated vegetative vagus of the PNS is activated which shuts down the active defenses and results in lowered BP & heart rate.
- ▶ Body also produces endogenous opioids that mediate our perception of pain and create alterations in sense of time, place, and reality.

OVER AROUSAL VS. UNDER AROUSAL

▶ Over arousal symptoms

- ▶ Anxiety and fear
- ▶ Intrusive memories
- ▶ Triggered reactions
- ▶ Concentration problems
- ▶ Nightmares
- ▶ hyper vigilance

▶ Under Arousal symptoms

- ▶ Emotional numbing
- ▶ Social avoidance
- ▶ Hypersomnia
- ▶ Fatigue and low energy
- ▶ Dissociation

- ▶ *when this occurs, our threat response system may be underactive which could lead us to miss signs of potential danger.

HIPPOCAMPUS

- ▶ Also part of the limbic system.
- ▶ It's function is to give time and space to events.
- ▶ It provides context.
- ▶ So when a crisis occurs, the hippocampus is bypassed.
- ▶ What would this mean for memory? Especially trauma memory.
- ▶ Prolonged cortisol secretion suppresses hippocampal activity (Gunnar & Barr, 1998)
 - ▶ What does this mean?

LIMBIC SYSTEM + TRAUMA MEMORY

- ▶ The two parts of the limbic system play a major role in trauma memory.
- ▶ Implicit versus explicit memory.

HOW CAN I USE THIS INFORMATION?

- ▶ Many clients find it helpful to know what is happening to them during a crisis/traumatic event is typical.
 - ▶ Education
 - ▶ Use hand to educate all types of client. Can be technical or informal.
- ▶ We now know that clients do not have the capacity to encode the information immediately.
 - ▶ Provide a safe place for individuals to share his or her story. As he or she recalls more, the implicit memories will integrate with the explicit ones and provide context for the event.
 - ▶ For some, this may be more difficult and will become stuck reliving the experiences quite vividly. This calls for the trauma focused treatments such as TFCBT, EMDR, CPT, Prolonged Exposure and Cognitive Restructuring.

- ▶ Water helps.
 - ▶ Why?
- ▶ The more basic the intervention at the beginning of treatment for a crisis event, the more successful.
 - ▶ Have to create safety or the client will not feel secure to share and process what actually occurred.

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