



FOUR LITTLE “F” WORDS

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NEUROBIOLOGY OF TRAUMA

WHAT IS A TRAUMA?

- ANYTHING THAT HAPPENS TO OR AROUND US THAT OUR BRAIN DOES NOT KNOW HOW TO RESPOND TO IS CONSIDERED A TRAUMATIC EVENT.

Memories

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graph TD; Memories --> Explicit["Explicit Memory (Declarative)"]; Memories --> Implicit["Implicit Memory (Procedural)"]; Explicit --> Semantic["Semantic Memory"]; Explicit --> Episodic["Episodic Memory"]; Implicit --> Procedural["Procedural Memory"]; Implicit --> Emotional["Emotional Memory"];
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Explicit Memory (Declarative)

→ Conscious and purposeful recollection of: factual information, previous experiences, and concepts.

Semantic Memory

→ General knowledge and facts

Episodic Memory

→ Your perception of an event or experience as it happened

Implicit Memory (Procedural)

→ Recollection of acquired memories that are used unconsciously that can affect thoughts and behaviors

Procedural Memory

→ Automated memories used to perform actions without actively thinking about it

Emotional Memory

→ The memory of emotions you felt during an event or experience

Part 2: The Four Types of Memory in Action

1. SEMANTIC MEMORY



You remember what a bicycle is.

2. EPISODIC MEMORY



You remember the sights and sounds and how scary it was to hit the rock and fall.

3. PROCEDURAL MEMORY



You can ride a bicycle automatically, without having to stop and recall how it's done.

4. EMOTIONAL MEMORY



Next time you see your bike, you're flooded with embarrassment because people saw you at an awkward and vulnerable moment.

National Institute for the
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EXPLICIT MEMORY

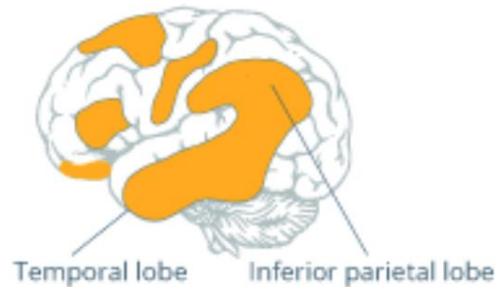
SEMANTIC MEMORY

How Trauma Can Affect It

Trauma can prevent information (like words, images, sounds, etc.) from different parts of the brain from combining to make a semantic memory.

Related Brain Area

The temporal lobe and inferior parietal cortex collect information from different brain areas to create semantic memory.



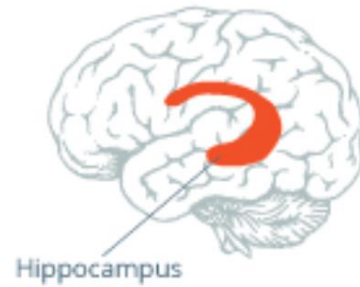
EPISODIC MEMORY

How Trauma Can Affect It

Trauma can shutdown episodic memory and fragment the sequence of events.

Related Brain Area

The hippocampus is responsible for creating and recalling episodic memory.



IMPLICIT MEMORY

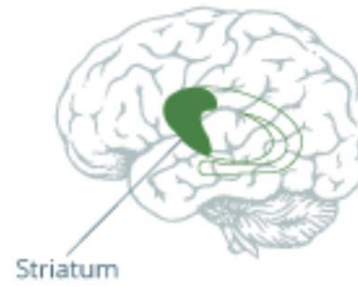
PROCEDURAL MEMORY

How Trauma Can Affect It

Trauma can change patterns of procedural memory. For example, a person might tense up and unconsciously alter their posture, which could lead to pain or even numbness.

Related Brain Area

The striatum is associated with producing procedural memory and creating new habits.



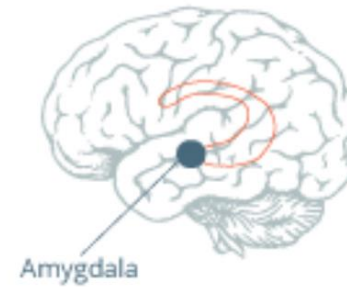
EMOTIONAL MEMORY

How Trauma Can Affect It

After trauma, a person may get triggered and experience painful emotions, often without context.

Related Brain Area

The amygdala plays a key role in supporting memory for emotionally charged experiences.





- INSERT A TRAUMATIC EVENT...
- YOUR BRAIN IS EXPERIENCING A NEW EVENT AND MUST DETERMINE MULTIPLE THINGS AT ONCE
 - SAFE OR UNSAFE
 - FIGHT
 - FLIGHT
 - FREEZE
 - FAWN

FIGHT

Your body reacts instantly to the threat without thought of consequences.



FLIGHT

Your body detects a threat that it feels it cannot overpower – can come after one of the other three responses.



FREEZE

Your body physically 'freezes' in place or remains immobile when a threat is detected
Typically, thoughts/active thinking also 'freezes' or ceases thinking temporarily

Tonic immobility - body paralysis that may or may not be accompanied by the mind



FAWN

- NOT USUALLY A 'SHORT TERM' RESPONSE — SEE IT OFTEN IN LONG TERM (DV)
- 'PEOPLE-PLEASER' LABEL — ALWAYS GOES WITH THE FLOW
- APPEASES THE ASSAILANT FOR GREATEST CHANCE OF SURVIVAL
- EXAMPLE: BANK HOSTAGE

TRAUMA → NEW MEMORY → NOW WHAT?



Triggers

Re-
traumatization

ACE Scores

ACE SCORES

- an attempt to measure the level of trauma a child has been through to predict possible outcomes in adulthood

And/or a way to gauge the level of trauma an adult has been through to assist or address current mental or physical health concerns

Why would we need a measurement or baseline for a person's past trauma?



Potentially traumatic events that happen in childhood

“Potential” due to each person being different and we cannot predict how every situation will end, i.e. parent’s divorce



Earliest, foundational pathways for the brain

Sets the framework for self-care, relationships, and social interactions

Induces chronic, toxic stress when a child develops the mentality that they must always be scanning for “safe vs not safe” people, places, and events

2-5x more like to experience IPV, DV, or SA when a connection between love and violence is created in adolescence

ACE SCORES

33% report no ACEs

With 0 ACEs

1 in 16 smokes

1 in 69 has alcoholism

1 in 480 injects drugs

1 in 96 attempts suicide

51% report 1-3 ACEs

With 3 ACEs

1 in 9 smokes

1 in 9 has alcoholism

1 in 43 injects drugs

1 in 10 attempts suicide

16% report 4-8 ACEs

With 7+ ACEs

1 in 6 smokes

1 in 6 has alcoholism

1 in 30 injects drugs

1 in 5 attempts suicide

STUDY OF 1,000+ PARTICIPANTS

ONCE THE CYCLE STARTS..



Cause I Ain't Got a Pencil

I woke myself up
Because we ain't got an alarm clock
Dug in the dirty clothes basket,
Cause ain't nobody washed my uniform
Brushed my hair and teeth in the dark,
Cause the lights ain't on
Even got my baby sister ready,
Cause my mama wasn't home.
Got us both to school on time,
To eat us a good breakfast.
Then when I got to class the
teacher fussed
Cause I ain't got no pencil.

by Joshua T. Dickerson

A Child's Struggle:
Sometimes it's more than just a pencil...



TRAUMA INFORMED COMMUNICATION

- BENEFITS – DE-ESCALATION, BUILD RAPPORT, ESTABLISH YOURSELF AS A SAFE PERSON, SIMPLY BEING KIND IS THE RIGHT THING TO DO
 - VERBAL + NON-VERBAL
 - START BY BELIEVING
 - MEET THEM WHERE THEY ARE
- Create a safe environment and establish yourself as a safe person
 - Be transparent to build trustworthiness
 - Utilize your peers/coworkers
 - Collaborate with partnering professions
 - Return control by giving them a voice and allowing choices
 - Be mindful and aware

QUESTIONS?

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