

The neurobiology of trauma and domestic violence

What you need to know and why

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Who am I?



Psychologist

Trainer/Clinician/Evaluator
Expert in the field of DV

Translator and Comedian

The humor is to keep you
awake and interested

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Making sense of the brain...

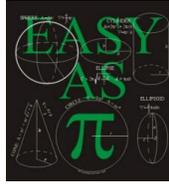


The neuroscience won't tell you what IS...
it will inform you about what might be...

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Overview of today's talk

- Domestic Violence and Organizing
- Brain basics
- Brain science & trauma
 - Threat networks without trauma
 - The brain during trauma



A few Domestic Violence basics

Intimate terrorism & Secondary aggression

Situational Couples Violence



A few Domestic Violence basics

What most of us call "domestic violence"

Intimate terrorism



Power & Control



A Repetitive Pattern that slightly changes CONSTANTLY

A few Domestic Violence basics

It's the victim's abusive response to the perpetrator

Secondary aggression



It's time to
FIGHT BACK!



A Repetitive Pattern that slightly changes CONSTANTLY

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A few Domestic Violence basics



Situational Couples Violence



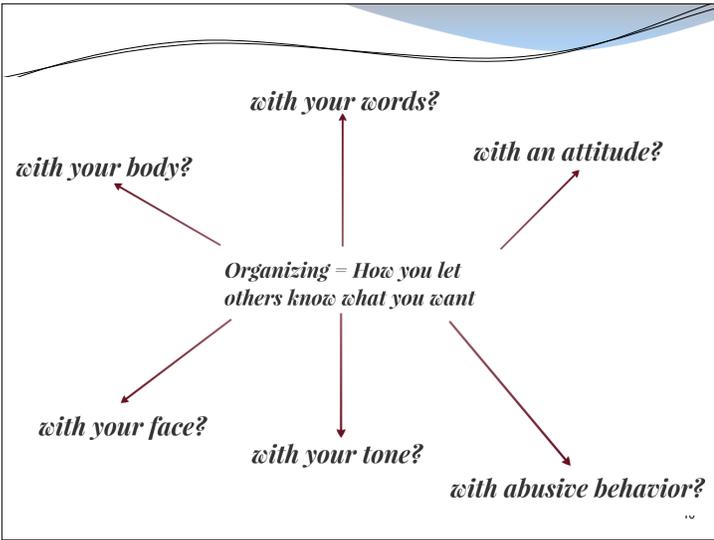
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ORGANIZING!

*IT'S HOW I
LET YOU KNOW
WHAT I WANT...*



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A few Intimate Terrorism basics

We all organize

It can be very, very subtle

Add fear/threat and it's a very powerful way to influence

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You don't need to be physically abusive to psychologically terrorize someone!

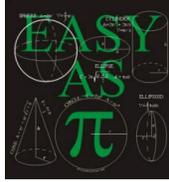
This is due to how the brain responds to threat and what happens during/after a traumatic experience!

"My broken bones always healed eventually, but honestly, it's been 15 years and I'm still trying to get over being told I was worthless, that no one would ever love me but him, and that I didn't deserve to live. I just can't feel safe with someone."

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Why neuroscience?



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Why neuroscience?



Because the brain of a trauma victim is fundamentally DIFFERENT!

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***Understanding the neurobiology of trauma
is about understanding what might
otherwise not make sense.***

**A few thoughts
before we jump in**

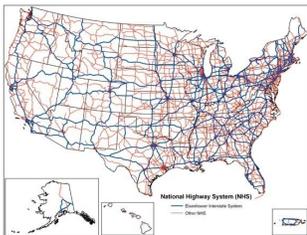
I'm not a neuropsychologist



**A few thoughts
before we jump in**

Regarding the brain: we are simplifying!

**It would be as if we talked about the road map
only in terms of I-5**



Defining Trauma



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Defining Trauma



Extreme fear/terror/horror

PLUS



Lack of control/perceived lack of control

EQUALS



Very real changes in the brain
at the time of the incident
AND after the incident

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Defining Trauma

"It's just the brain doing what the brain does."

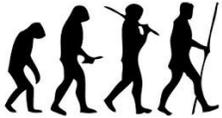
~ Me



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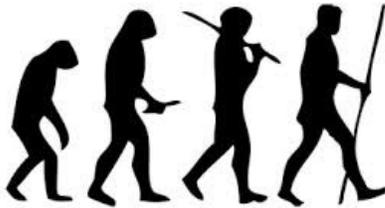
Circuits & Neural Networks

- “Baked in” due to evolution/design for the purposes of helping us deal with being attacked.
- We can “condition” brain circuitry to respond to future similar smell, sound, context.



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**Circuits =
Baked in to your brain**



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Circuits & Neural Networks

- The neurons that fire together wire together
- The more often/more intense = robust network



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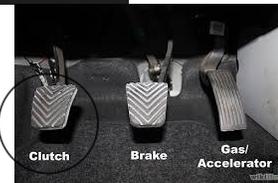
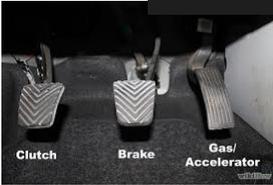
Neural Networks = Repetition over time!



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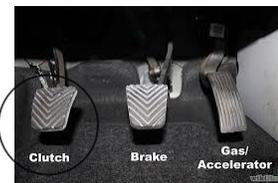
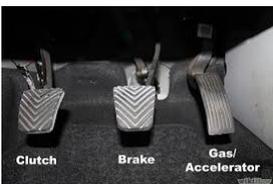


**REAL DRIVERS
USE 3 PEDALS**

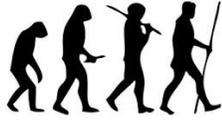


What's the take away?

You can't wish away or logically think away
an established neural network!



TRAUMA affects circuits



and
networks!



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A few brain basics

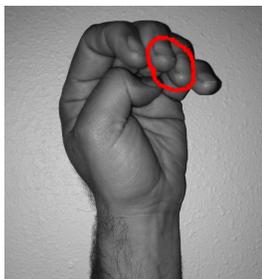
You have a brain-map in your fist!



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A few brain basics

Pre-frontal cortex = your middle nails



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A few brain basics

Pre-frontal cortex plays a role in:

Top-down attention: *you consciously chose!*



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A few brain basics

Pre-frontal cortex plays a role in:

Top-down attention

Integration of data: *consolidation of memory/narrative*



equals



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A few brain basics

Pre-frontal cortex plays a role in:

Top-down attention

Integration of data

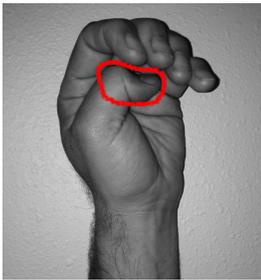
Logical decision making



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A few brain basics

Limbic System = area around your thumb



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A few brain basics

Limbic System plays a role in:

Threat network



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A few brain basics

Limbic System plays a role in:

Threat network

Memory encoding



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A few brain basics

Limbic System plays a role in:

Threat network

Memory encoding

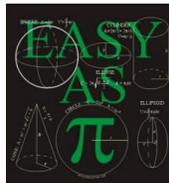
Emotion



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Predict and Protect!



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Consistently assess for safety



Involves:

- Eyes, ears, nose, etc.
- Your maps of safety/danger

Our level of vigilance depends on the environment

Low or high?



The extremes are easy to understand...

Low or high?



Sometimes it's not so obvious...

Low or high?



Sometimes it's not so obvious...

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Intimate partner is supposed to = Map of Safety!



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“Sense” Danger

**DANGER
WILL ROBINSON!**



Involves:

- Eyes, ears, nose, etc...
- Fear network
(featuring the **amygdala**)
- NOT the pre-frontal cortex!

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Assess the threat!



Involves:

- Eyes, ears, nose, etc.

Map of threat?
or
Map of safety?

(thanks to the **hippocampus**)

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Assess the threat!



- Ears
- Eyes
- Nose
- Etc...



Map of threat?
or
Map of safety?

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Assess the threat!



Threat is **contextual**
and **subjective!**

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Assess the threat!



Threat is **contextual**
and **subjective!**

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Respond to the threat...



We do not think about our
response, we simply react.

More on this later...

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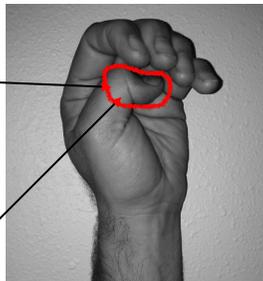
So far we haven't even made it up to the Pre-frontal Cortex!



Map of threat?
or
Map of safety?

Amygdala

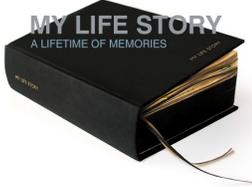
Hippocampus



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Once the threat has passed...

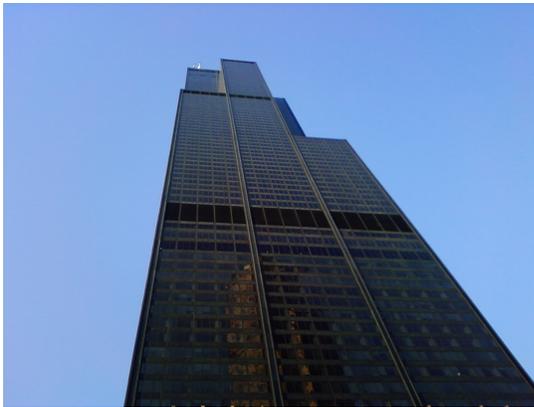
Learn from experience
Make logical decisions to minimize future risk



Involves:

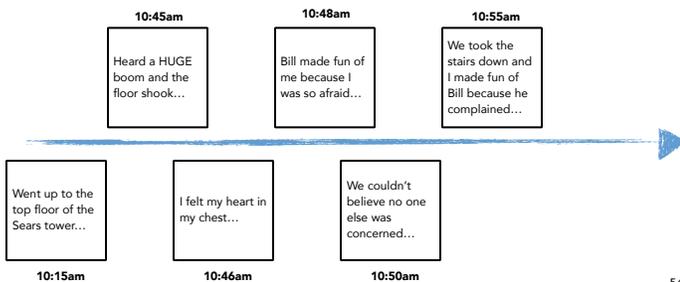
The integrative function of the pre-frontal cortex

Imagine for a moment...



As an aside...

- You will remember the details of what happened **IN ORDER**, and in quite some detail...



Additionally...



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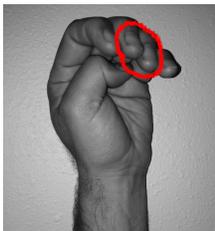
Additionally...



The beauty of extinction

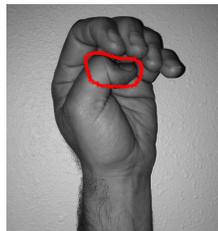
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The high road vs the low road



Fear

vs

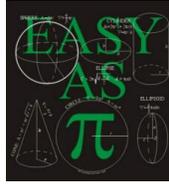


threat

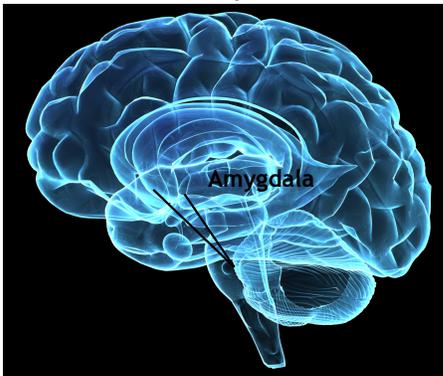
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During an assault Threat Circuitry is in charge!



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Threat Circuitry taking over =

- Impact on responding:
 - *Impaired* pre-frontal cortex
 - Survival reflexes/reactions
 - Self-protection habits



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High Stress + Fear = Impaired Prefrontal Cortex

Arnstén 1998, *Science*, 280, 1711-1712; Arnsten 2009, *Nature Reviews Neuroscience*, 10, ⁶¹

A few brain basics

Pre-frontal cortex plays a role in:

Top-down attention



Integration of data



Logical decision making



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A few brain basics

Pre-frontal cortex plays a role in:

~~Top-down attention~~



~~Integration of data~~



~~Logical decision making~~



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A few brain basics

With no pre-frontal cortex...what are you left with?



Reflexes and habitual behavior!

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Threat Circuitry in charge =

- **Impact on responding:**
 - *Impaired* pre-frontal cortex
 - Survival reflexes/reactions
 - Self-protection habits



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**IF you have a fear of snakes,
you may want to close your eyes.**

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Freeze/Pause



Maybe the monster won't see me!

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Freeze/Pause



Ready to suddenly
burst into action

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Are we predators or prey?

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We started out as prey!



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~~Fight or flight?~~



What's your instinct when you see this dude on the trail?

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~~Fight or flight?~~



We freeze first,
then flee if possible.

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FREEZE → FLEE → FIGHT!



It's not a CHOICE!

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**What happens when you're
already caught in the web?**



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Perpetrator dynamics/ grooming = spinning a web



Your attachment network



inhibits your threat network...



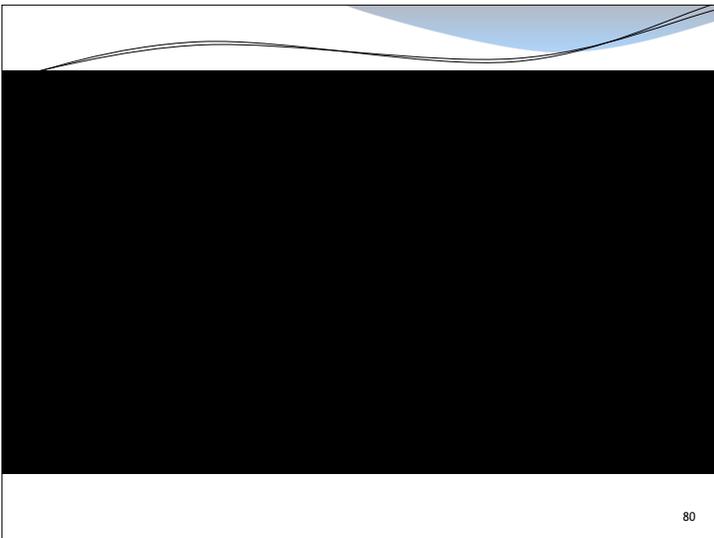
Mental confusion + threat = *mental defeat...*



So when does the brain respond to threat with “fight?”



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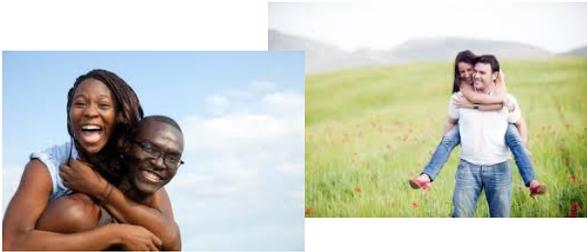
The perpetrator is a shark...



disguised as a dolphin!

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Intimate partners are supposed to be DOLPHINS not SHARKS!



How to FLEE when there's no (perceived) escape route



Drastic survival reflexes...

Dissociation

**Blanked/Spaced Out
Disconnected from Body**



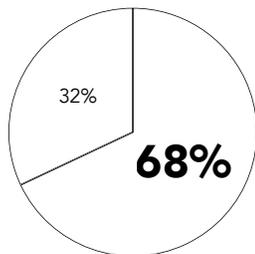
Autopilot

Dissociation

- It's adaptive
- It's one way your body disconnects from itself

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Incidence of sexual assault

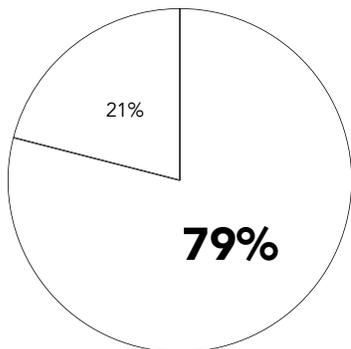


in a relationship with one physical assault

McFarlane, J., and A. Malecha, *Sexual Assault Among Intimates: Frequency, Consequences, and Treatments*, final report submitted to the National Institute of Justice, 2005

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Occurred more than once



McFarlane, J., and A. Malecha, *Sexual Assault Among Intimates: Frequency, Consequences, and Treatments*, final report submitted to the National Institute of Justice, 2005

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Tonic Immobility

- *Freezing* = Alert and immobile, but able to move
- Tonic immobility = Paralysis, can't move or speak
- Caused by extreme fear, physical contact with perpetrator, restraint, perception of inescapability
- Can occur in sexual *and* non-sexual assaults

Marx et al. 2008, *Clin Psychol Sci Practice*, 74; Bovin et al. 2008, *J Trauma Stress*, 402; Brickman & Briere 1984, *Int J Women's Studies*, 195; Fuse et al. 2007, *J Anx Disord*, 265 ⁸⁹

Tonic Immobility

Frequency of occurrence:

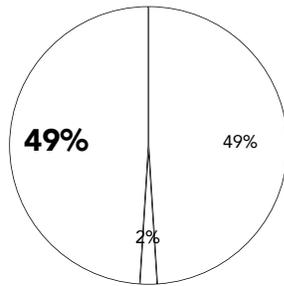
- depending on the study anywhere from 12% to 52% of victims suffer some form of tonic immobility

Galliano et al (1993). *Victim Reactions during Rape/Sexual Assault*, *Jrnl of Int Violence* 8(1): 109-14. Heidt et al. (2005). *Tonic immobility and childhood sexual abuse: a preliminary report evaluating the sequela of rape-induced paralysis*. *Behav Res Ther*. 2005 Sep;43(9):1157-71. ⁹⁰

The extent of fear

1992 study: N=714

Feared for her life during the sexual assault



From: Rape in America: A report to the nation. Prepared by Department of Psychiatric and Behavioral Sciences, Medical University of South Carolina, Charleston, SC

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Collapsed Immobility

Similar to tonic immobility

- Can't move or speak
- Causes = extreme fear, physical contact with perpetrator, restraint, perceived inescapability
- Evolutionarily old response
- Sudden onset (but more gradual offset)

Kozlowski et al., in press, *Harvard Rev Psychiatry*; Baldwin 2013, *Neurosci Biobehav Rev*, 1549; Bracha 2004, *CNS Spectrums* 679

Collapsed Immobility

Key differences from Tonic Immobility

- Extreme ↓ in heart rate and blood pressure
- Faintness, “sleepiness” or loss of consciousness
- Loss of muscle tone - Collapsed, limp, etc.

Kozlowski et al., in press, *Harvard Rev Psychiatry* ; Baldwin 2013, *Neurosci Biobehav Rev*, 1949



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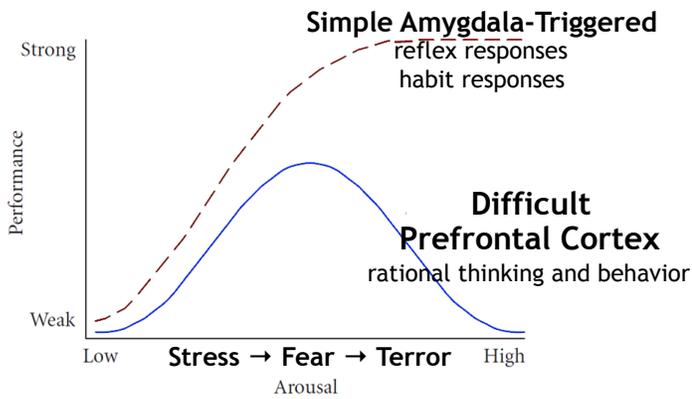
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- Impact on responding:
 - *Impaired* pre-frontal cortex
 - Survival reflexes/reactions
 - Self-protection habits



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The impact of stress on response



Adapted from Diamond et al. 2007, *Neural Plasticity*, 1-33.

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Self-Protection Habits



represent neural networks!

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Habits from childhood...

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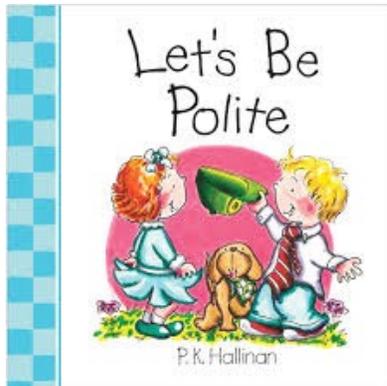


Habits from childhood...



Habits from a prior relationship...

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Habits from the way you were raised...

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