



The Hijacked Self:

Toward Feeling Alive Without Threat

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ANS Research

Collaborators

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Overview

- Describe first person experience and neurobiological findings related to the sense of self in trauma
- Discuss how the survival (brainstem/midbrain) brain, which processes trauma-related raw emotion and arousal, drives the default mode network, which may underlie the sense of self in trauma
- Discuss implications for treatment

The Sense of Self in the Aftermath of Trauma...





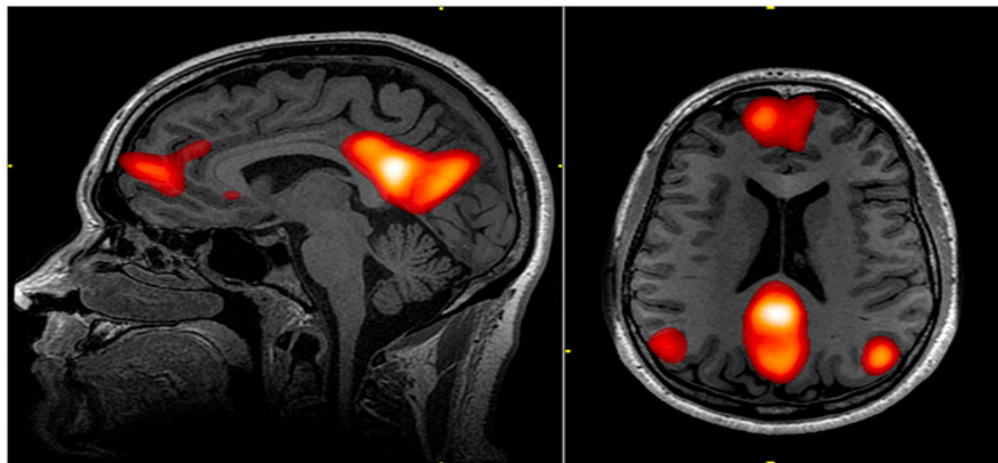
“I am not myself anymore”.

The Default Mode Network (DMN) as a Model for the Sense of Self

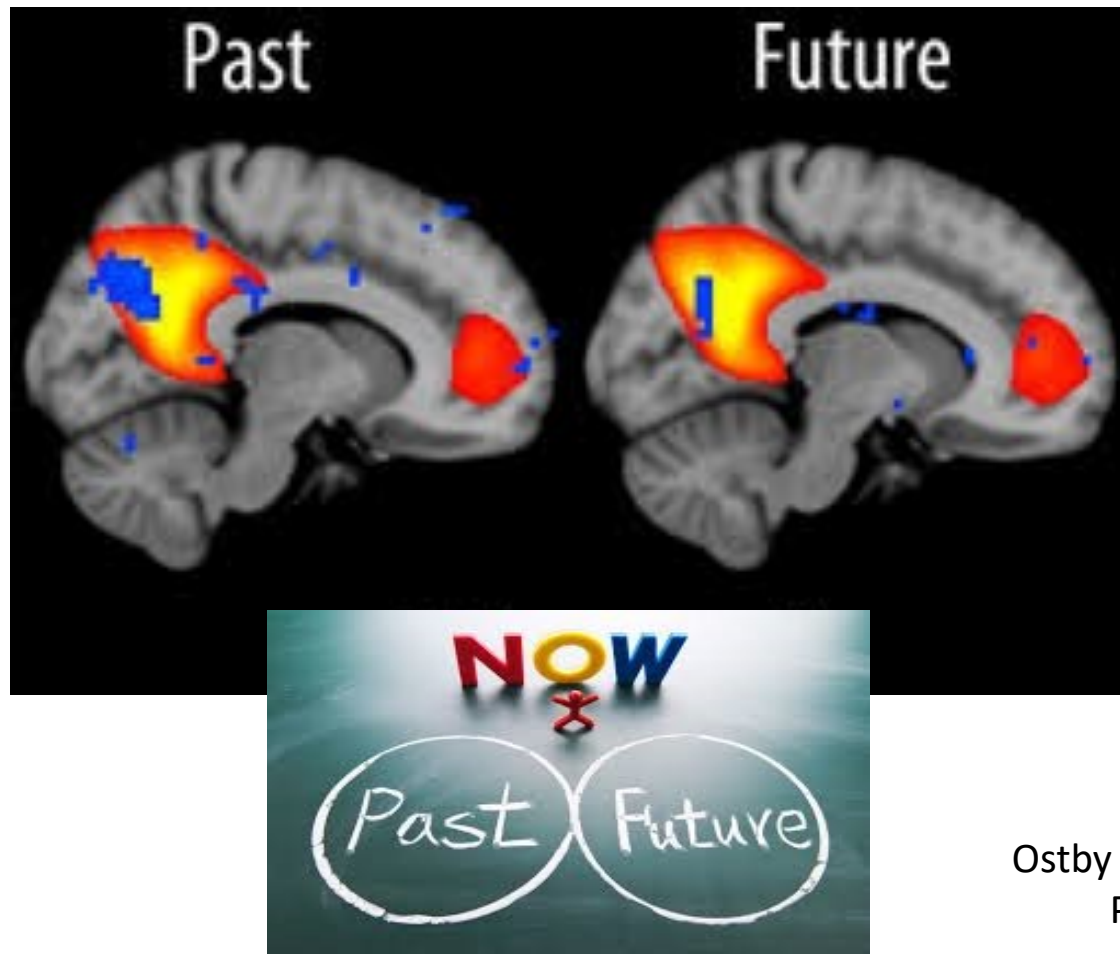


Functions of the DMN

- Self-reflection/interospection/self-awareness
- Autobiographical Memory
- Perceiving the perspectives of others/social connection
- Embodiment



Continued Experience of Self Across Time & into Future

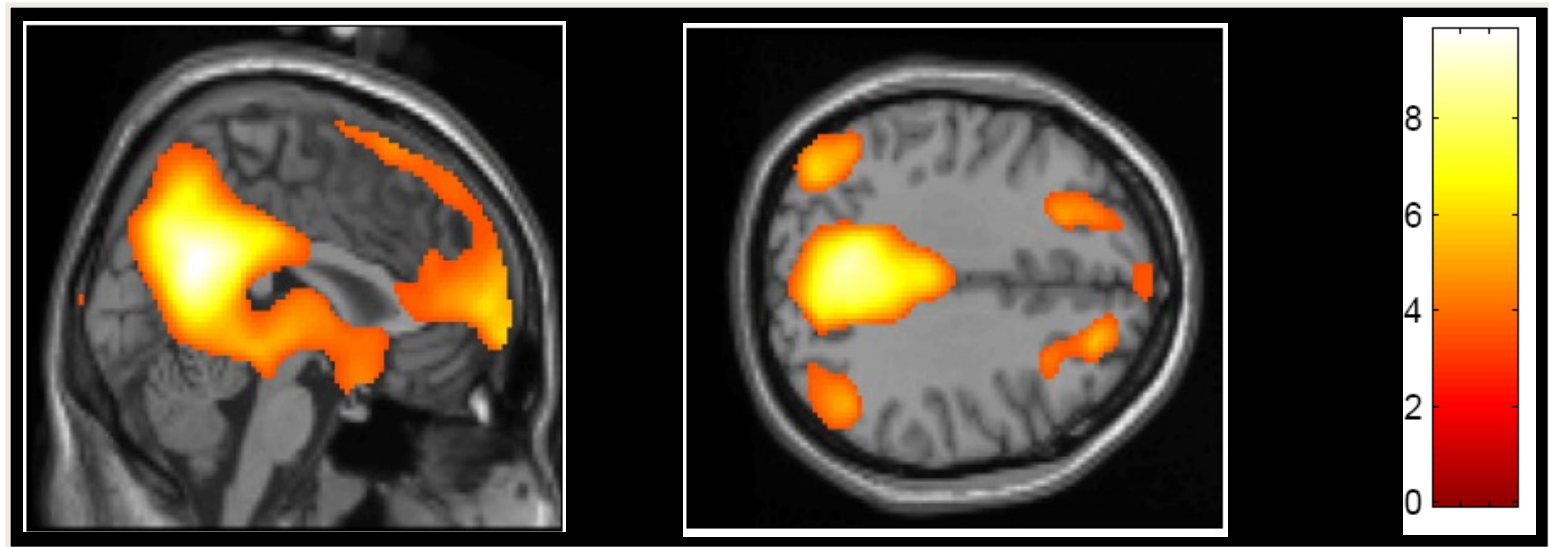


Ostby et al., PNAS, 2012;
Perkins, 2016

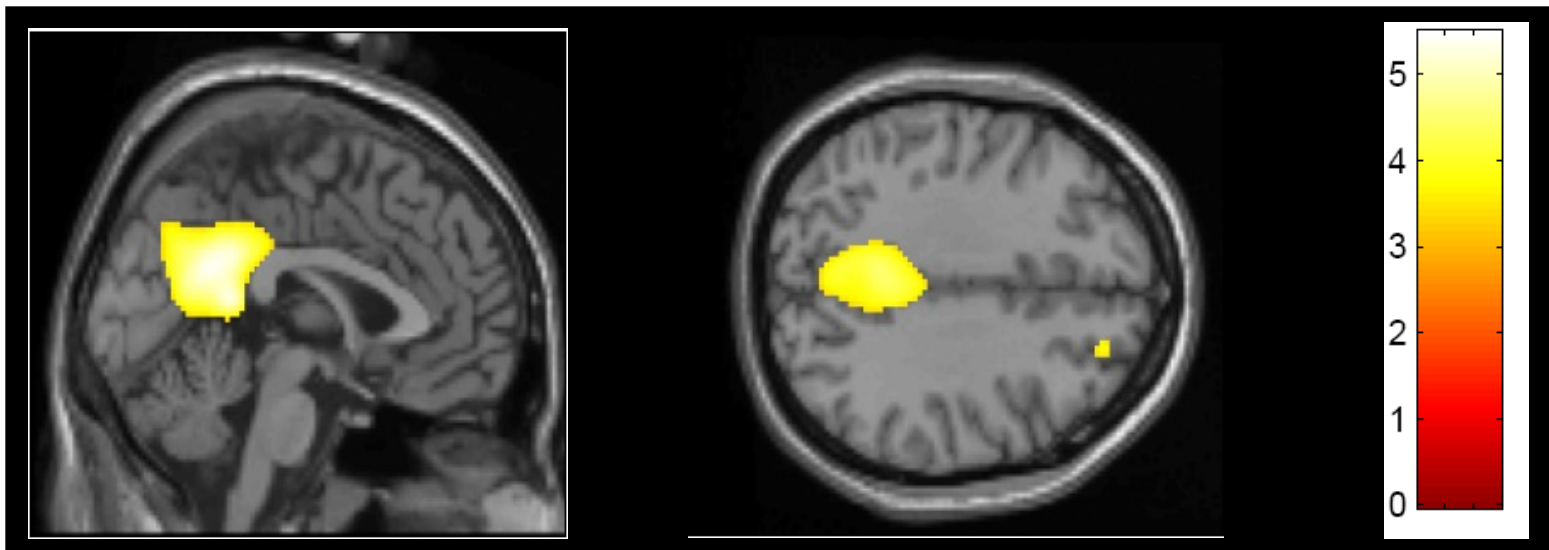
The Default Mode Network At Rest/Off Task



Controls (n=16): Positive Correlation



PTSD (n=18): Positive Correlation

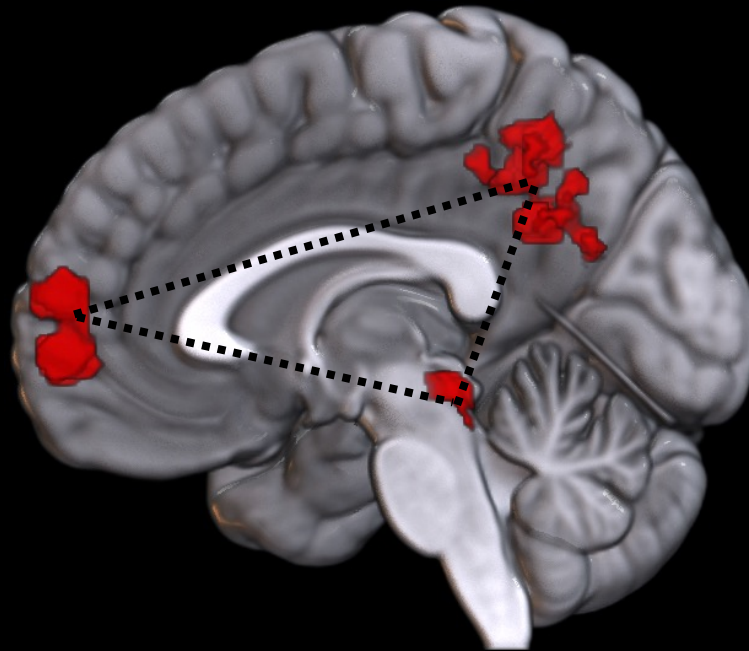




The
Default
Mode
Network
Under
Threat...

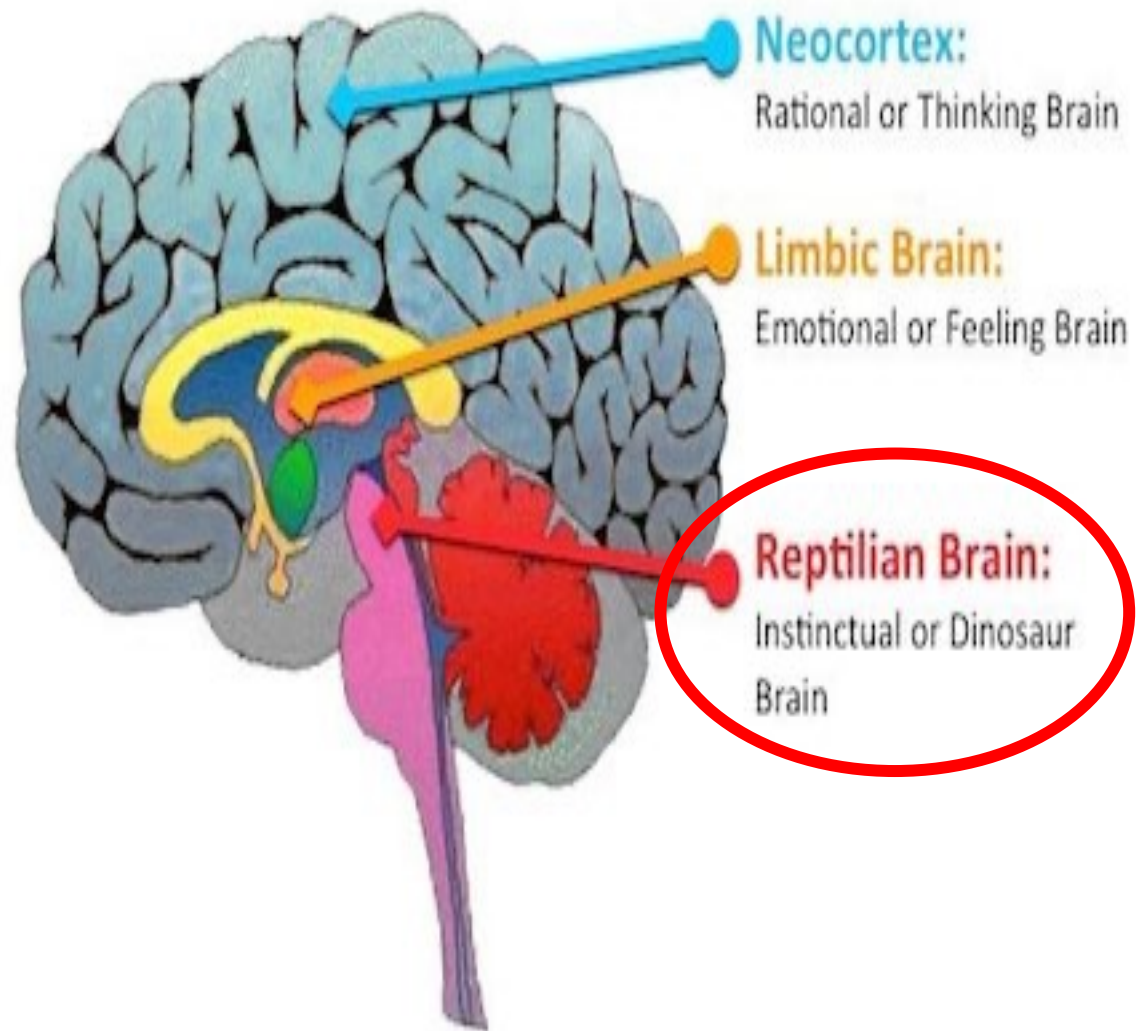
Default Mode Network Connectivity **Under Threat** in PTSD

PTSD (n=26) > Healthy Controls (n=20)

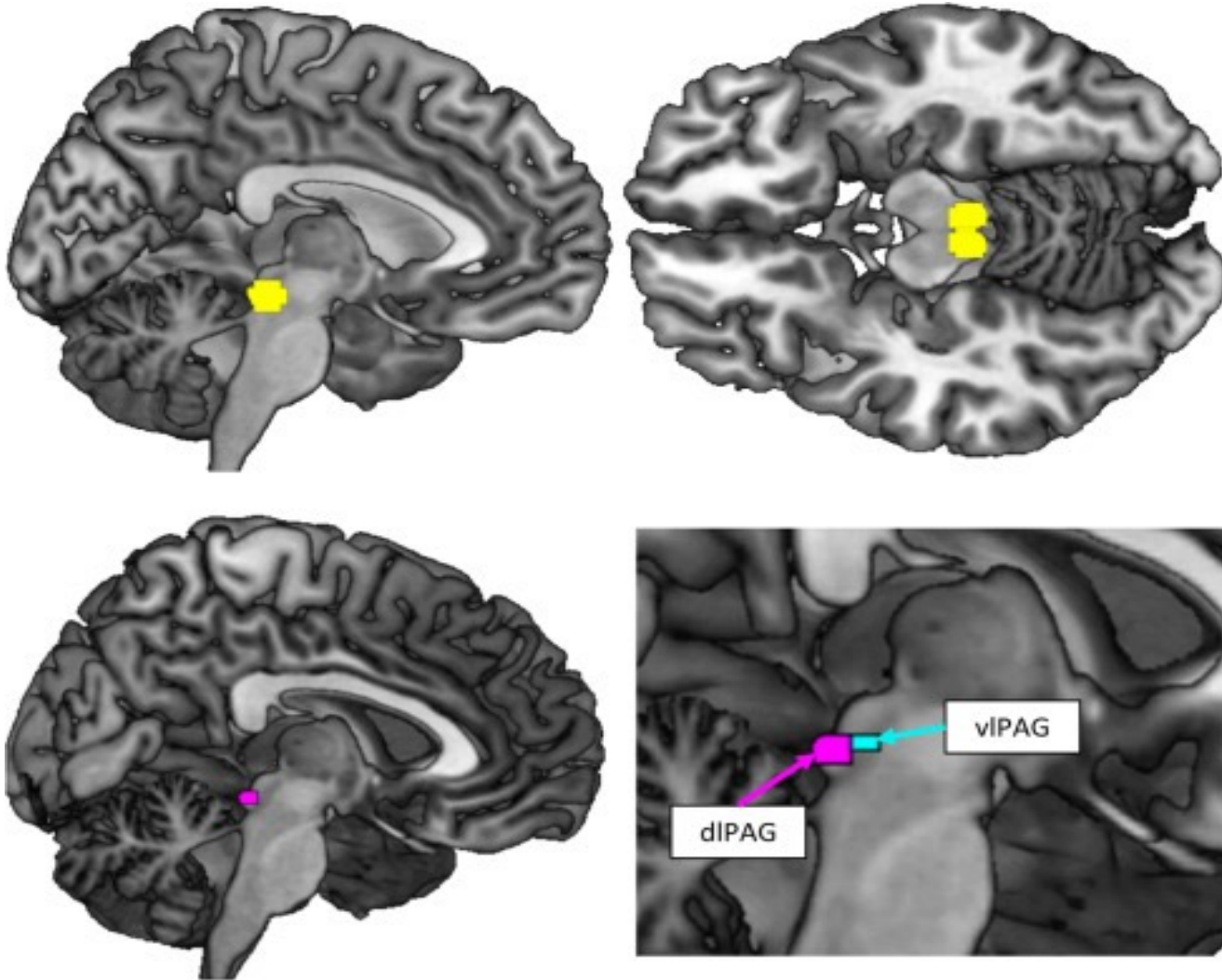


mPFC: [0, 60, -2]; PCN: [6, -52, 30]

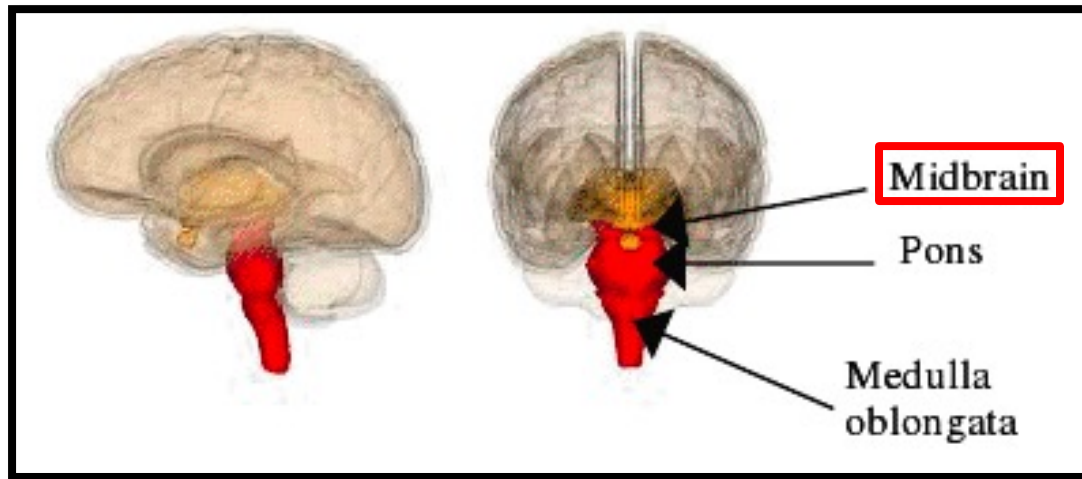
What drives default mode
network connectivity under threat?



Periaqueductal Gray (PAG)



When Fear Is Near



**Innate Behavioural
Knowledge**

**“Imminent danger results in fast, likely
‘hard-wired’, defensive reactions mediated by
the midbrain.”** – Mobbs et al., 2009, *J Neurosci*

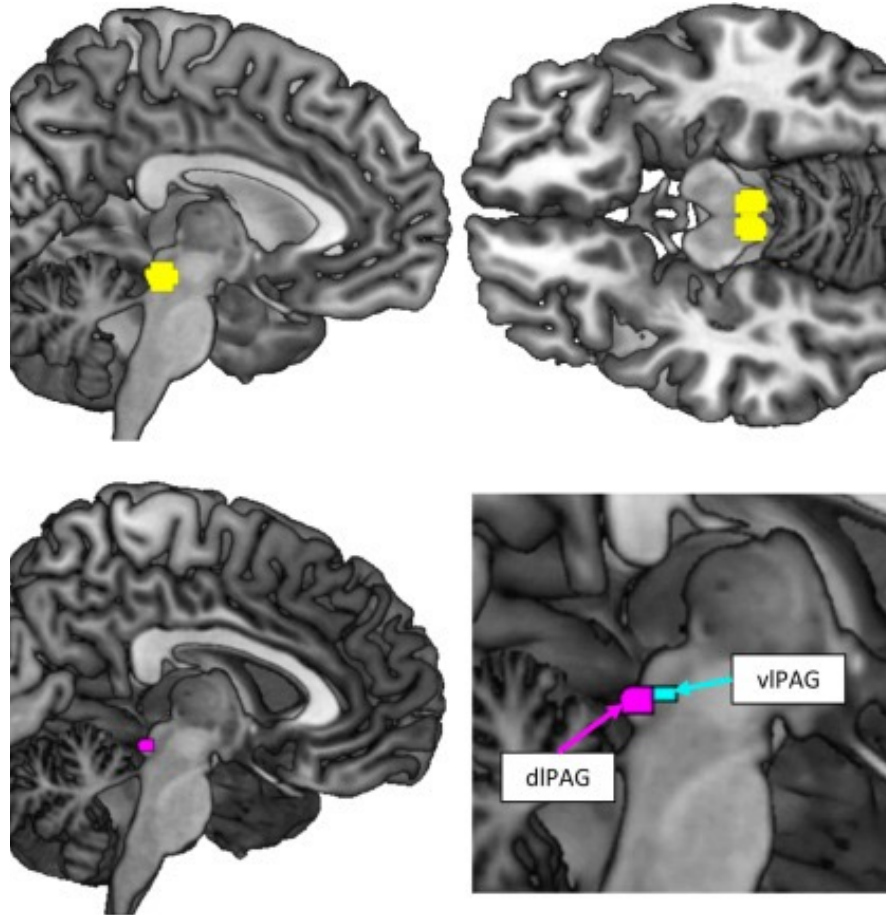
Autonomic Regulation

- **Dorsolateral subunit (dIPAG):**

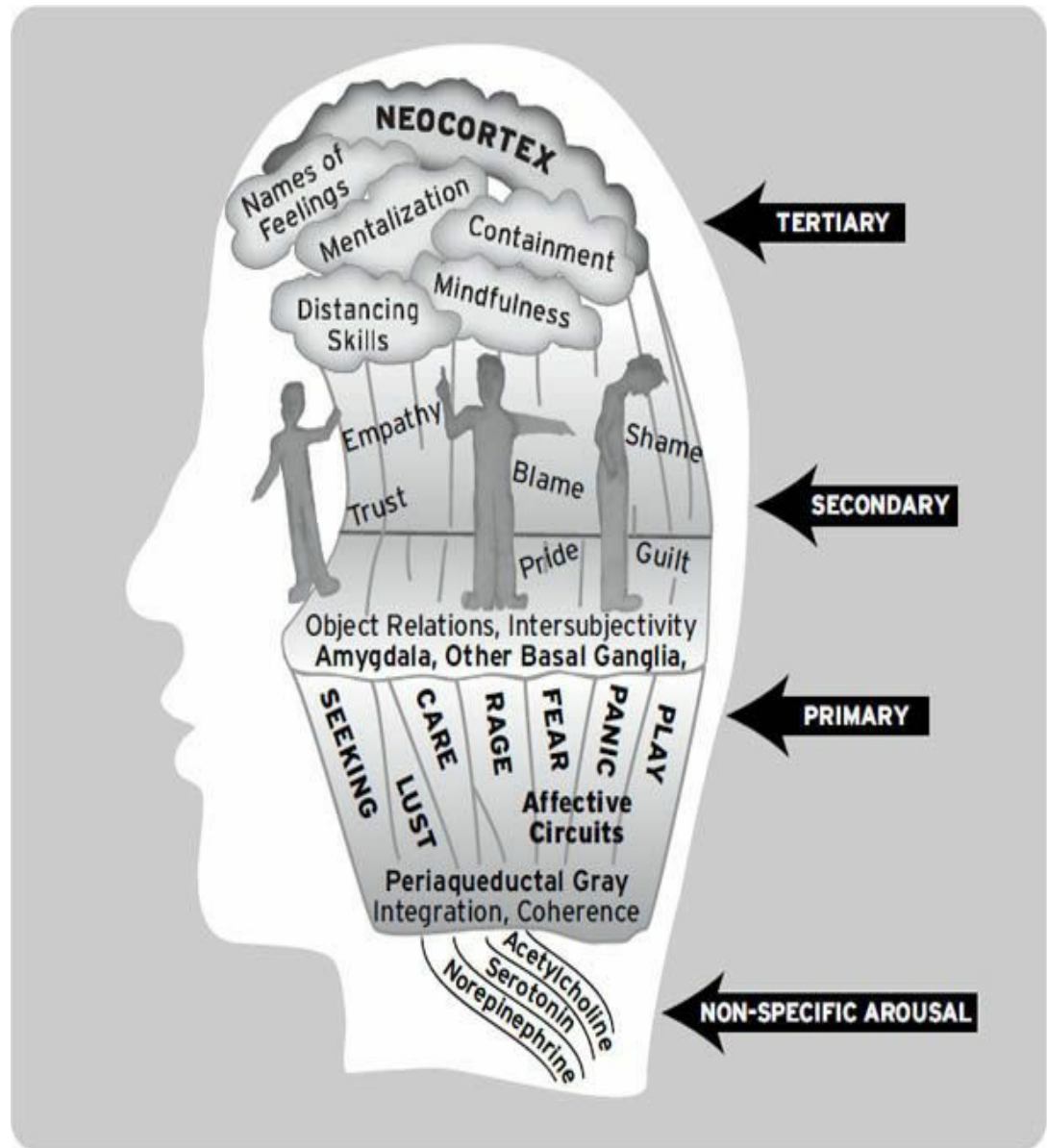
- Mediates sympathetic nervous system
- Stimulation induces fight-or-flight in rat

- **Ventrolateral subunit (vIPAG):**

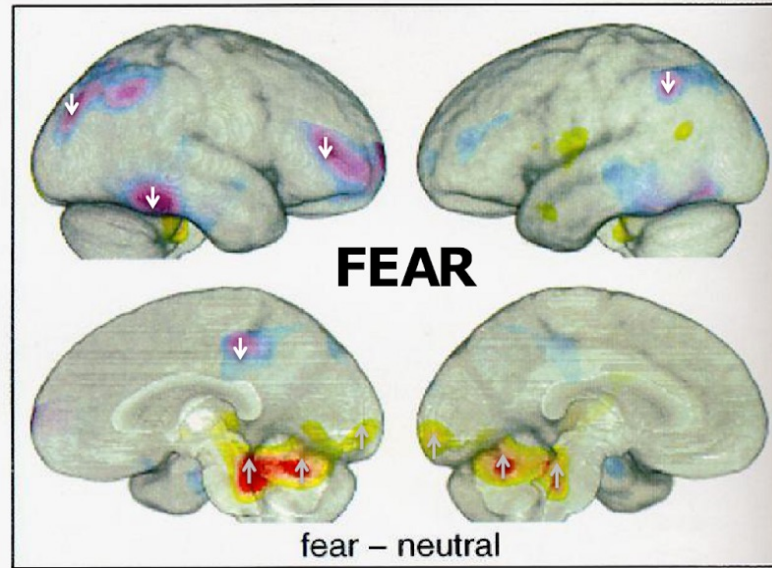
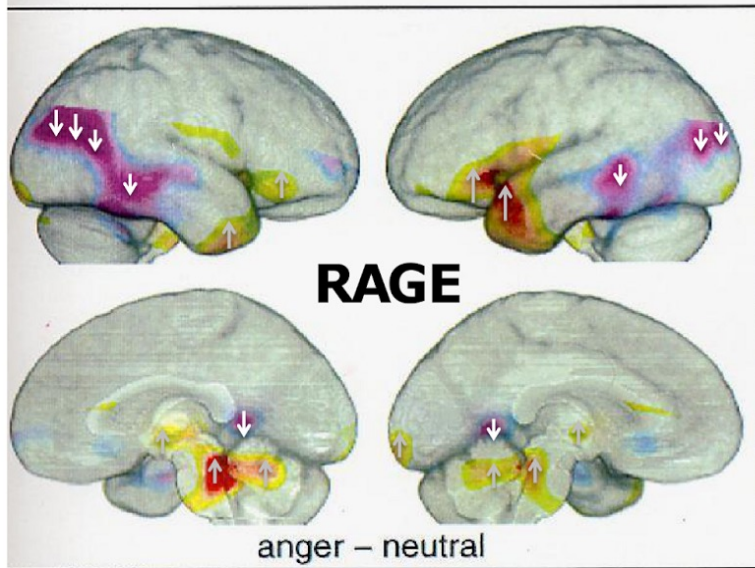
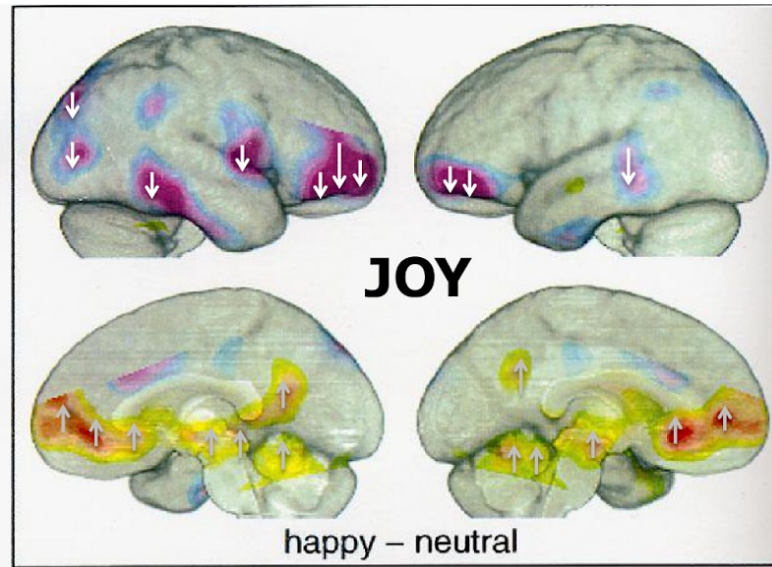
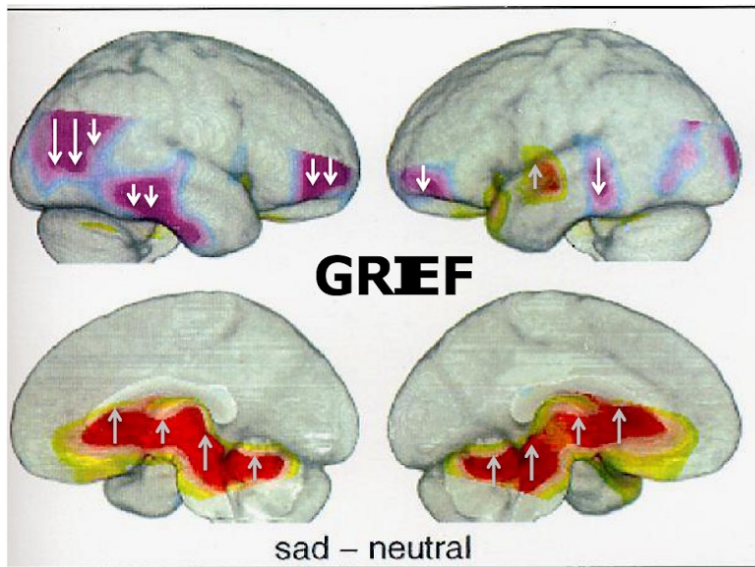
- Mediates parasympathetic nervous system
- Stimulation induces freezing/tonic immobility in rats



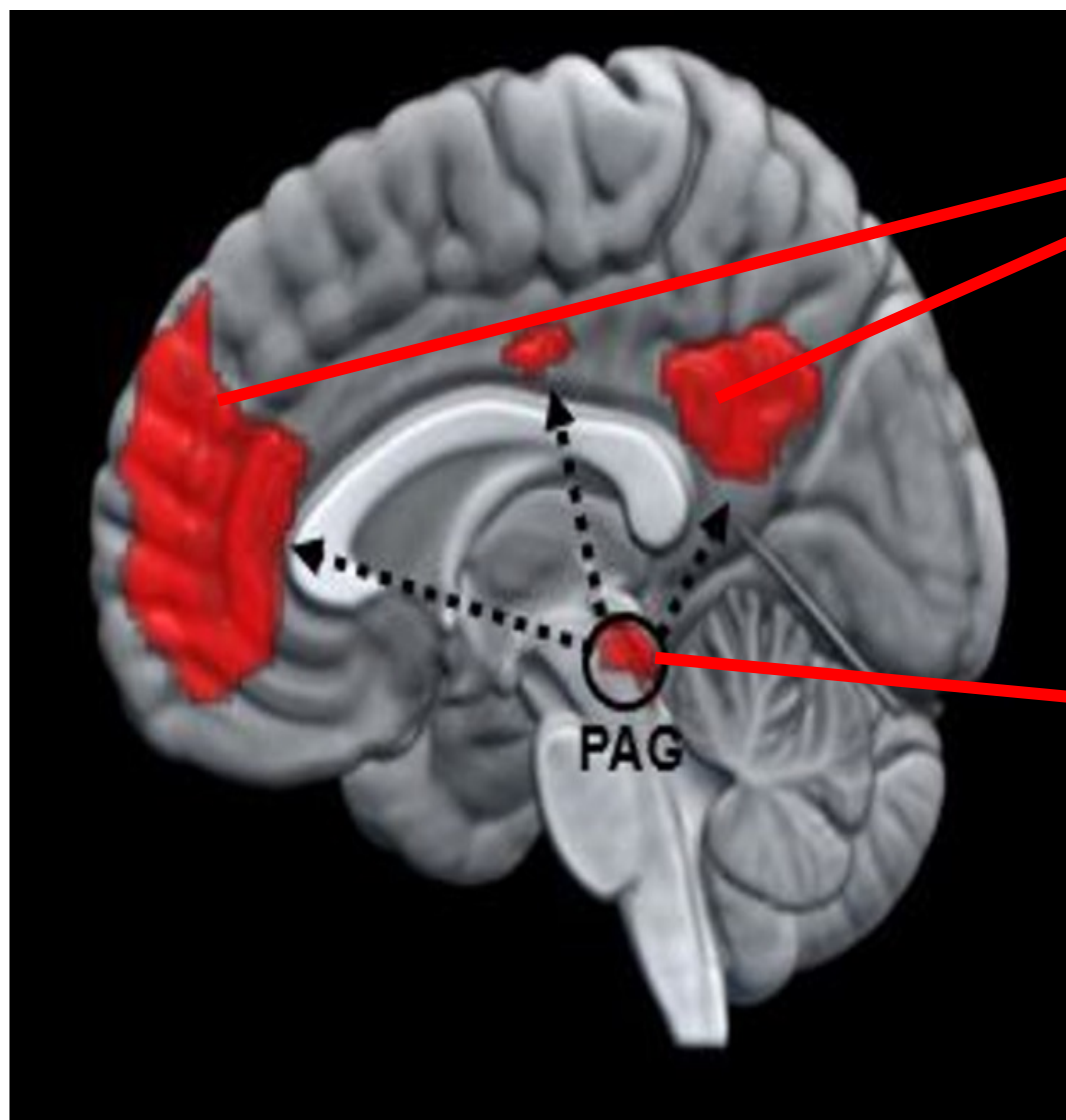
Primary Emotional Systems







In PTSD, the PAG Functionally
Connects to and Drives the
Default Mode Network



DMN

mediates self-related perspectives

PAG mediates physiological arousal and raw affect related to trauma

Trauma-
Related
Affect and
Arousal
Influences
Self-Related
Thoughts
and
Perspectives

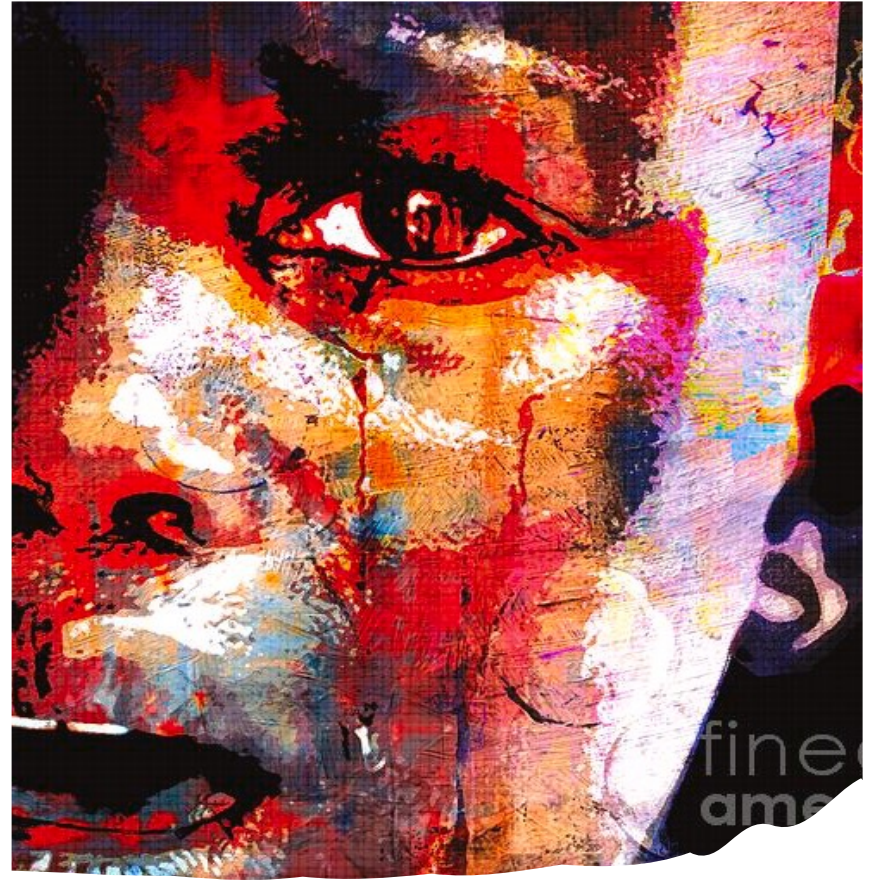
I
Feel,
therefore
I am.

#TRUTHBOMB

DANIELLELAPORTE.COM

Trauma
Becomes
Central to
One's
Identity





- Participants with PTSD reported more self-defining memories that were trauma-related (Sutherland and Bryant, 2005)



Implications for Reckless Behaviour

I starting shoplifting when I was five... I shoplifted well into my adulthood at great risk to me were I to be caught... It was always confusing why I did this. It was so, so risky. I knew that. But I think the adrenaline organized me, rising it seemed from my belly through my brain from the back to the front. I felt my feet; I knew my hands and fingers; I had eyes. I was agency. It lit me up. It was essential. At five and still at fifty I didn't exist to myself except as the artful dodger- at these moments I existed; all of me, in the act of stealing, I would 'come on line'.



A way of feeling alive?

Reckless Behaviour and Seeking of the Other...



But there is always seeking of the other embedded in this risk taking, and the wilder the need, the less discriminating who 'the other' is. It's not someone to stop you exactly, it's someone to meet you, to register you, to certify your existence. Shoplifting then not only provides the sense of self, it evokes the sense of other.

Seeking the Other in the Aftermath of Trauma





The default
mode network
is critical for
social
connection



Seeking the Other?

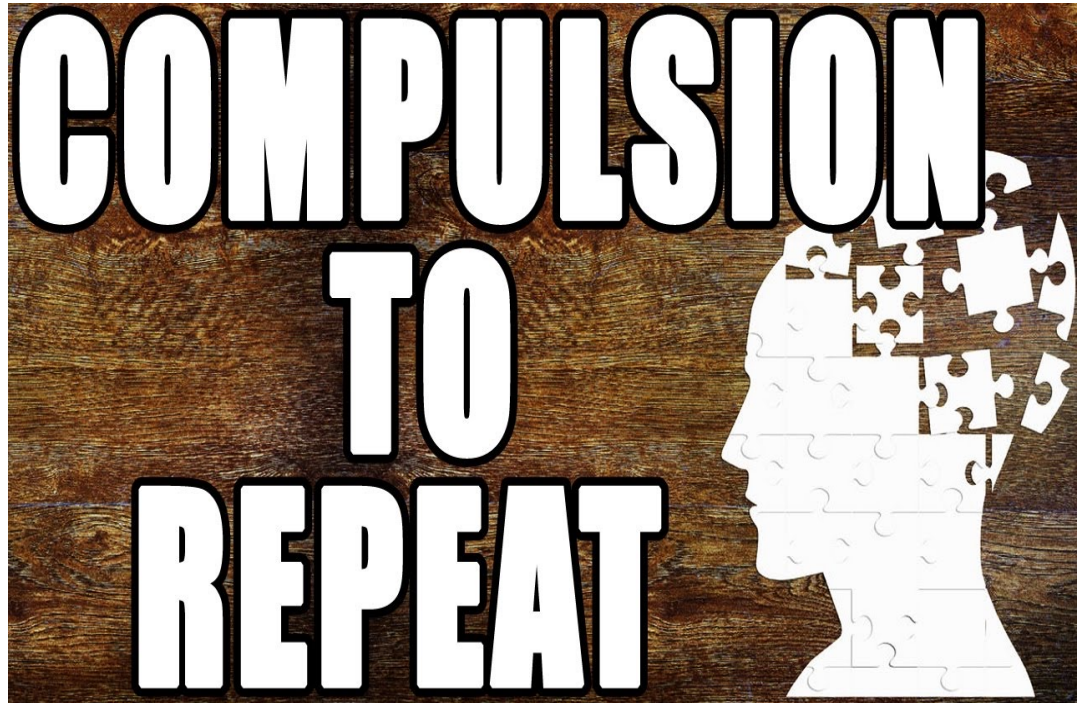
Domestic Violence





A way of maintaining the relationship
with the perpetrator...

The
Compulsion
to Repeat
the Trauma



Treatment Implications...



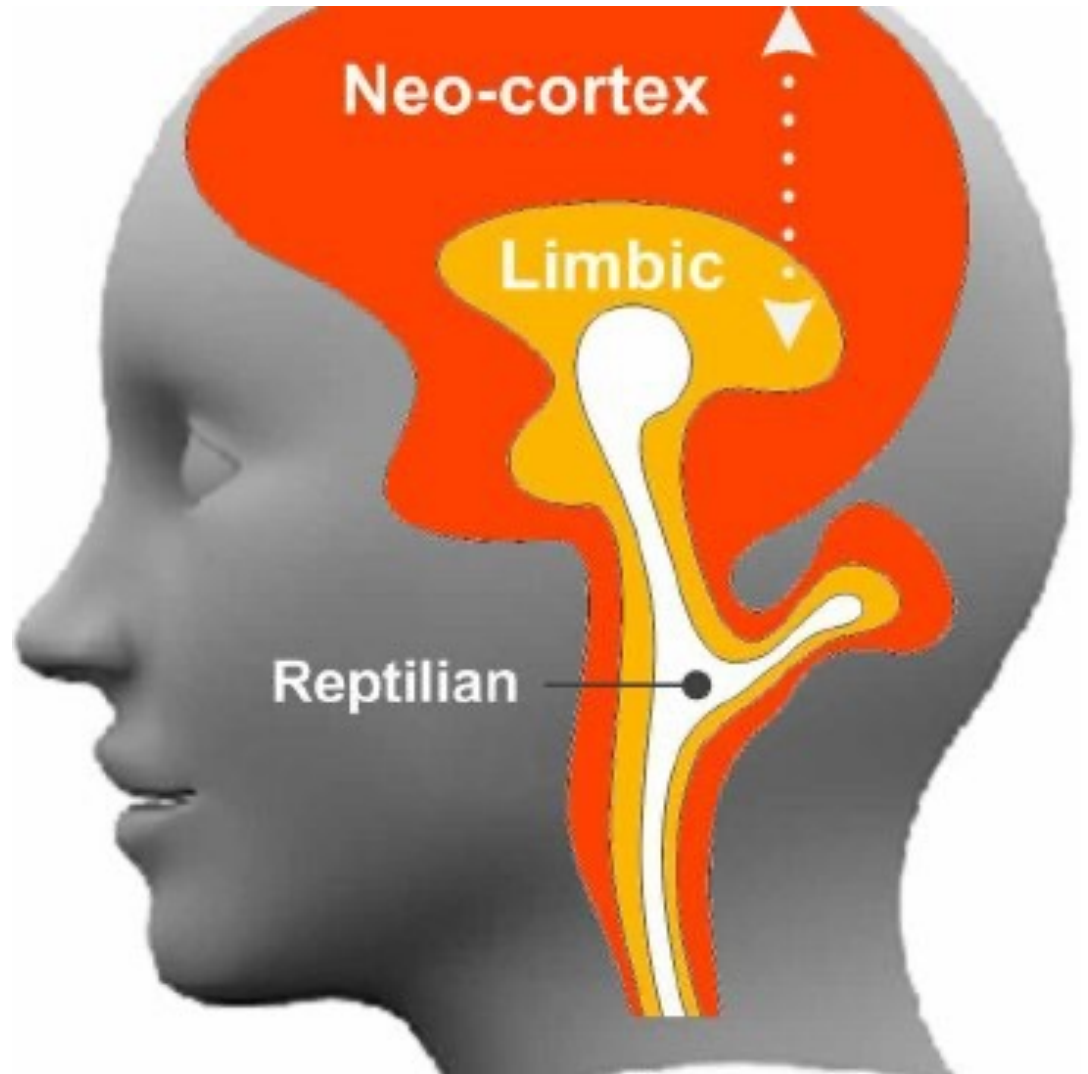
Uncoupling
the Default
Mode
Network
from the
Reptilian
Brain/PAG...





Toward Feeling Alive
Without Threat...

Targeting
Directly
Deep Brain
Circuits



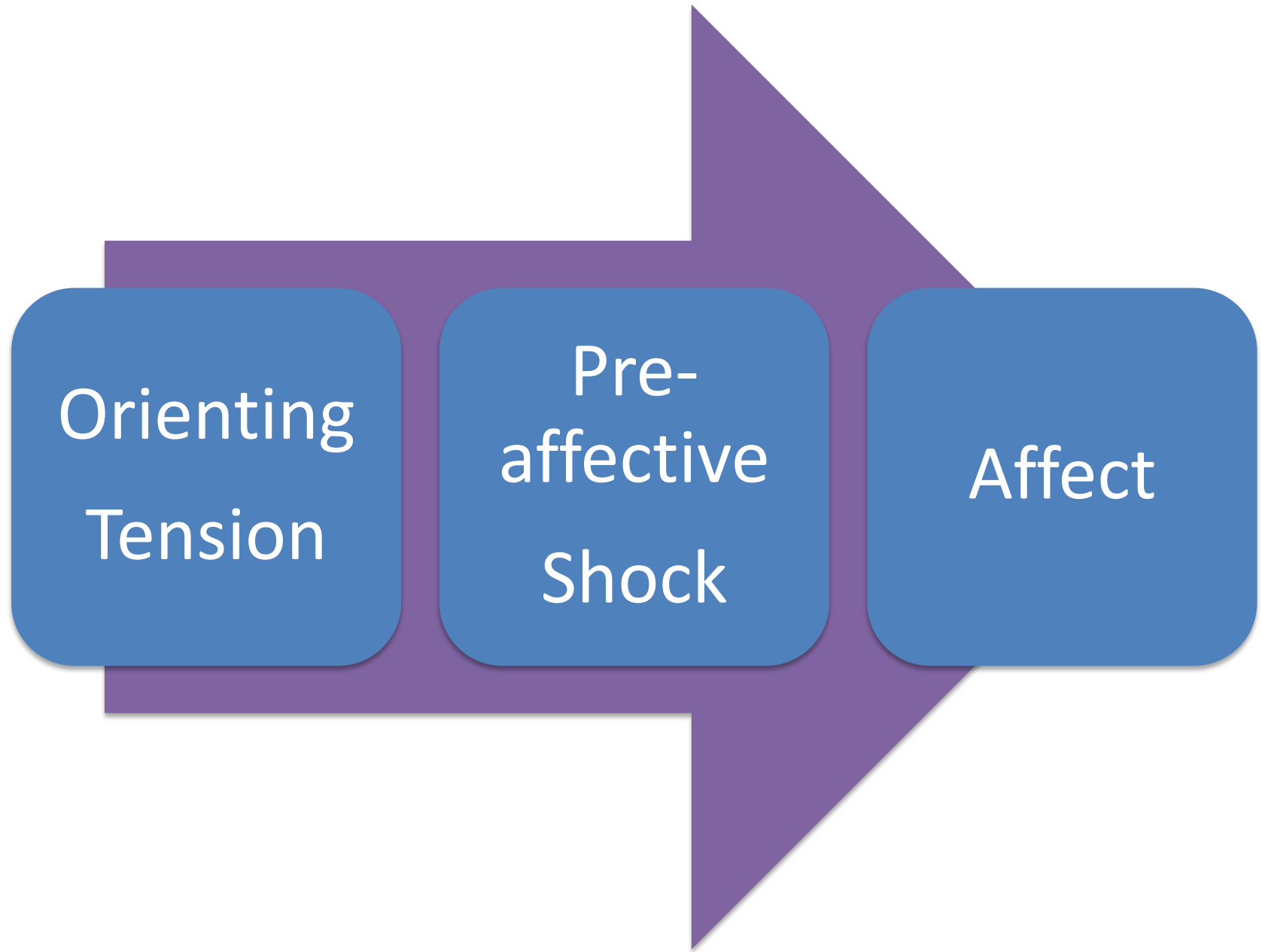
Body Oriented Treatments; Sensorimotor Treatments; Neurofeedback

I know it was not my fault,
but I can't stop feeling it. It
keeps tearing me up inside.



Deep Brain Reorienting:
A Form of Trauma Processing Targeting
Deep Brain Circuits

Corrigan, 2020



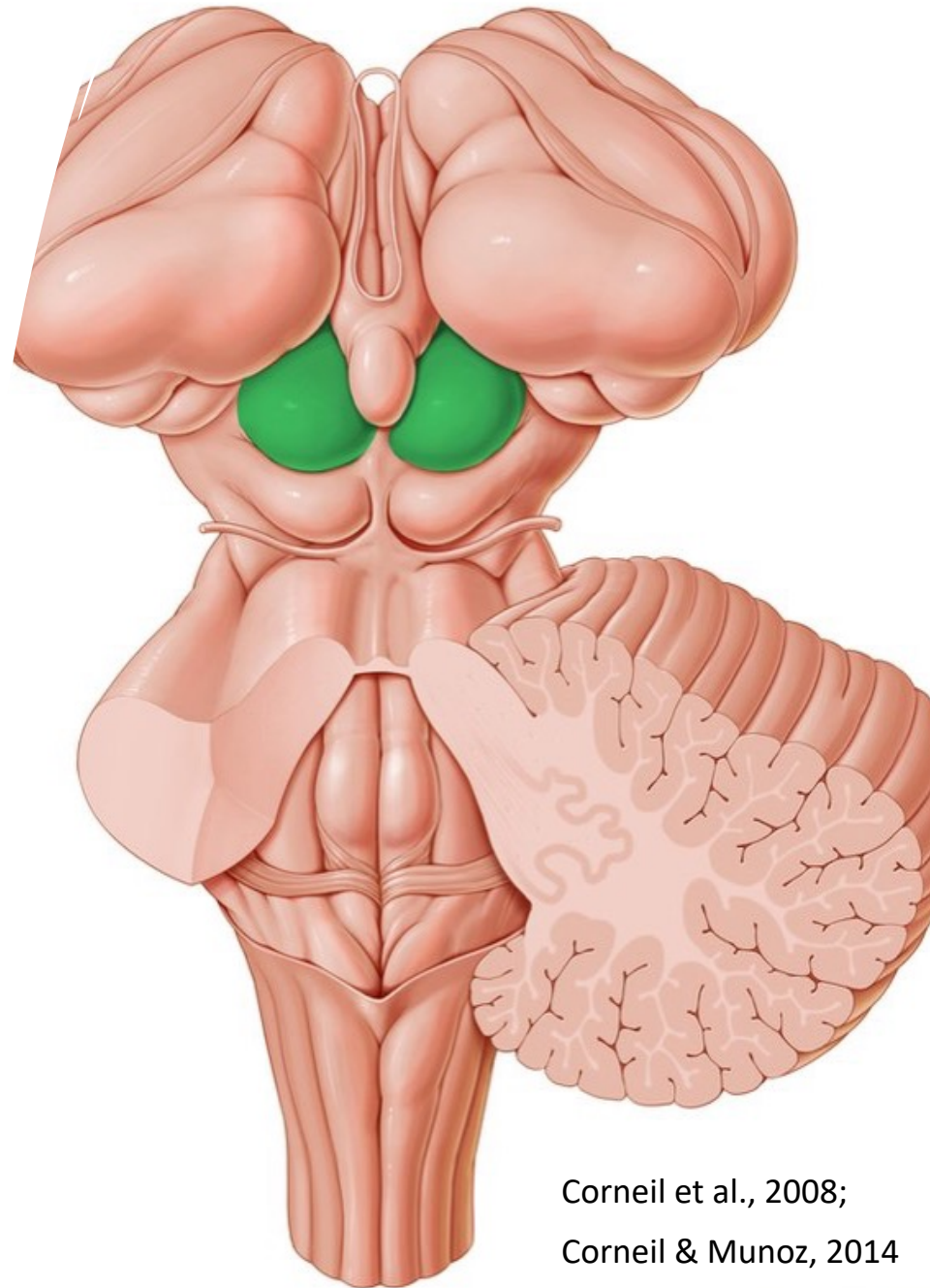
Orienting Response

- The orienting response is an organism's immediate response to a change in its environment
- The orienting response is a reaction to novel or significant stimuli



The Superior Colliculus/PAG: The Hub of the Orienting Response

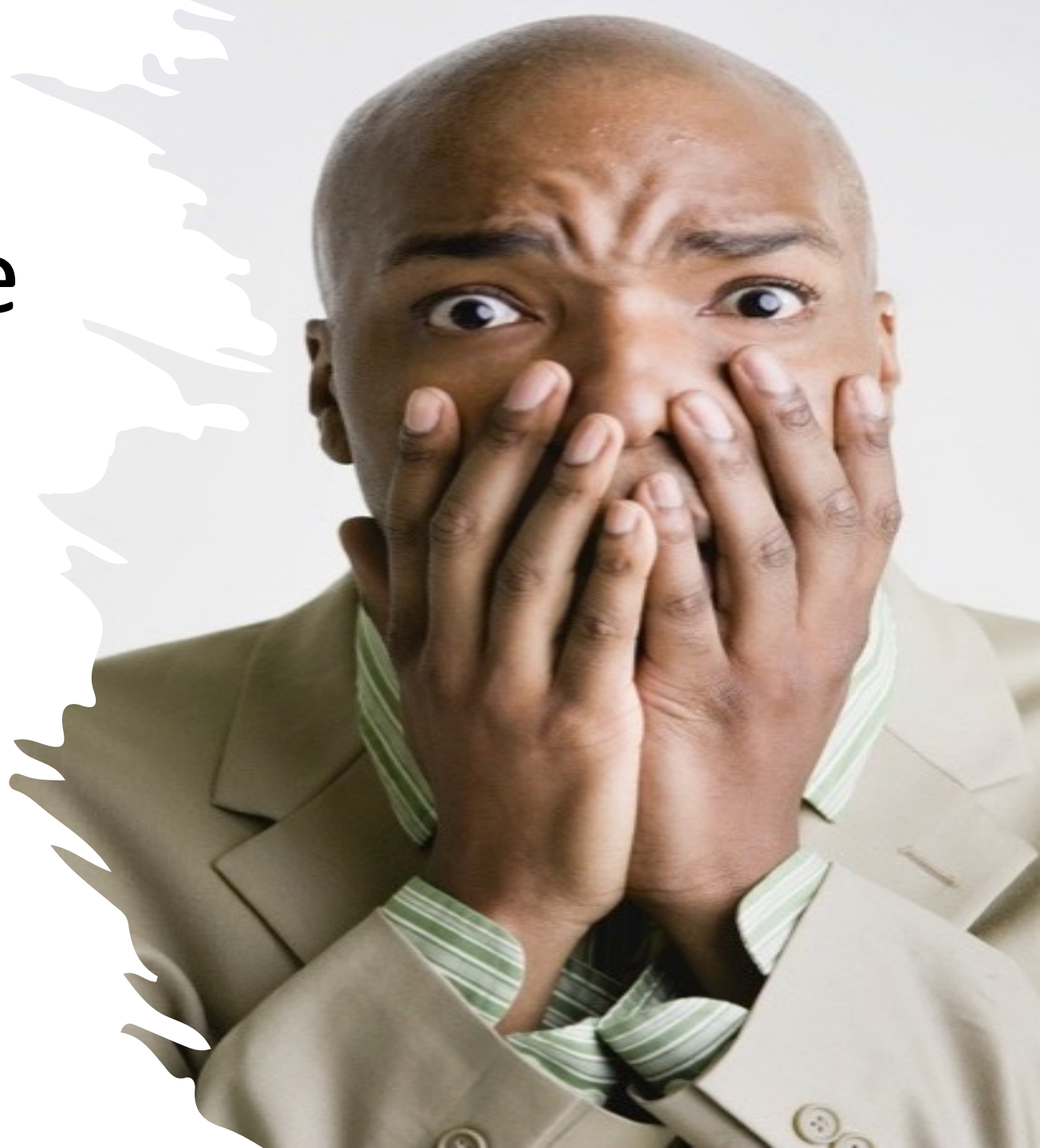
- SC facilitates eye and head movements during orienting
- The SC brings on a brief (orienting) tension in the neck
- SC closely connected to PAG



Corneil et al., 2008;

Corneil & Munoz, 2014

Pre- Affective Shock



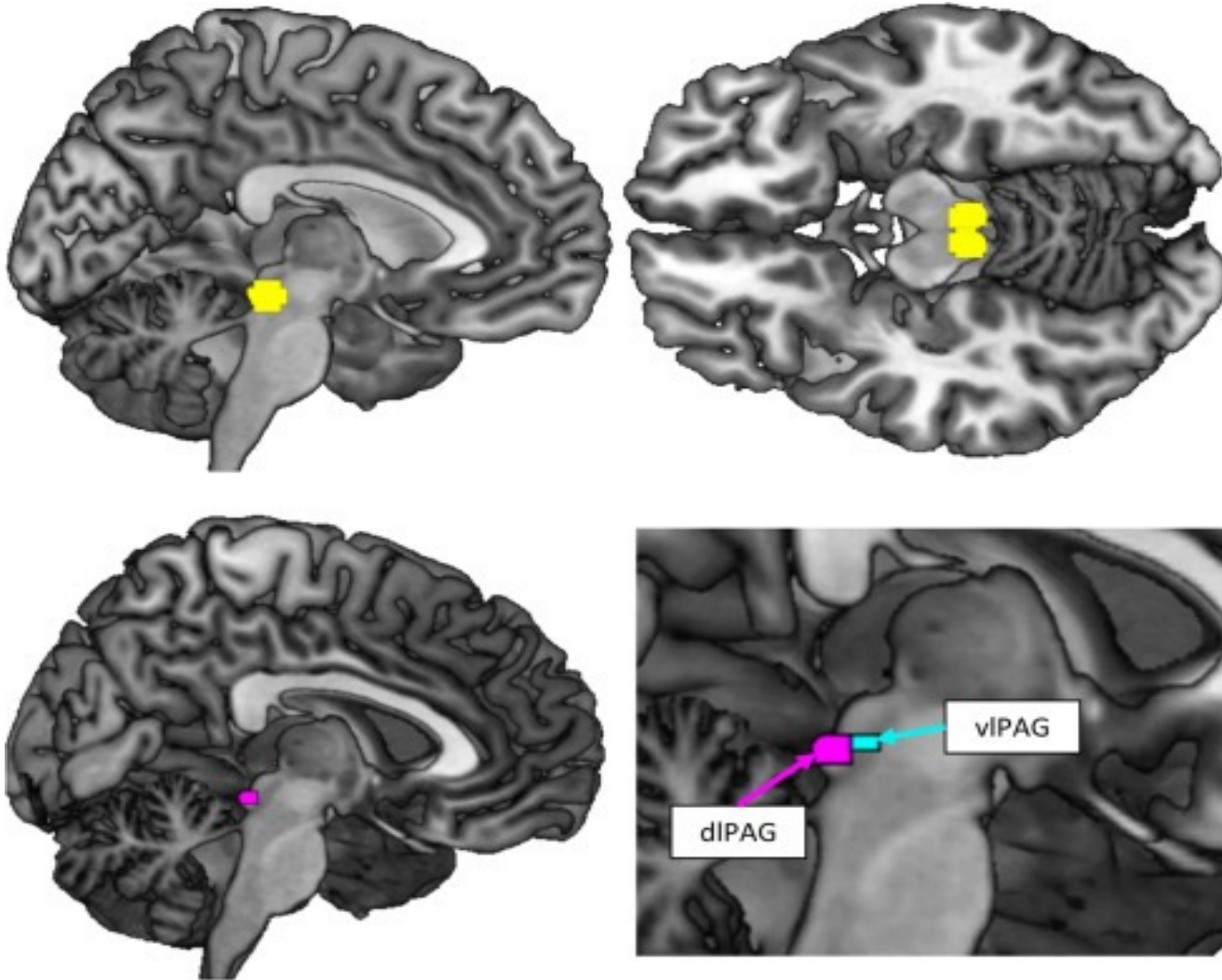


- Sometimes before the affect begins, there is an experience of shock or traumatic realization (e.g., "I'm going to be assaulted!")
- Hypothesized to be mediated by deep layers of the SC/PAG's connection to the locus coeruleus- secretes nordrenaline

Affect/
Raw
Emotion



Periaqueductal Gray (PAG)



Deep Brain Reorienting Sequence

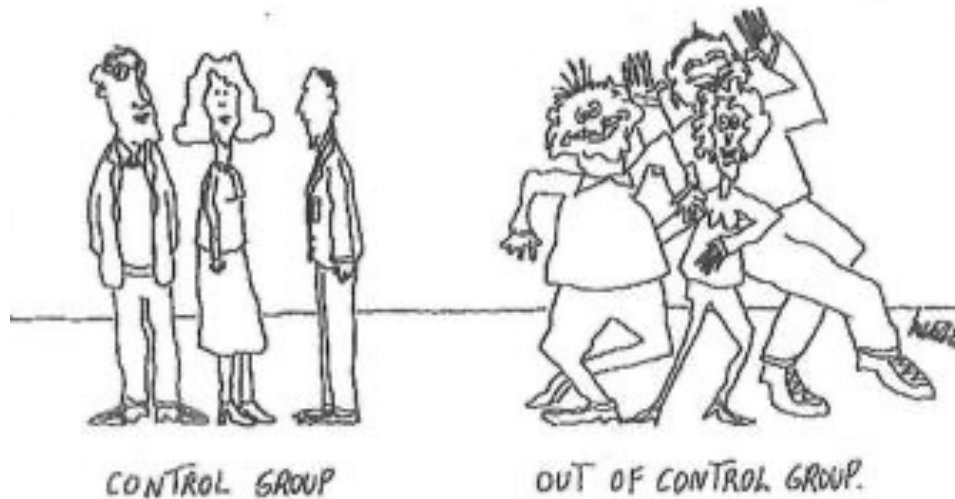
Orienting
Tension in neck
& face

Pre-affective
Shock

Affect

Focusing on the neck/face tension while processing affect
can prevent emotional overwhelm and dissociation

A RCT of DBR



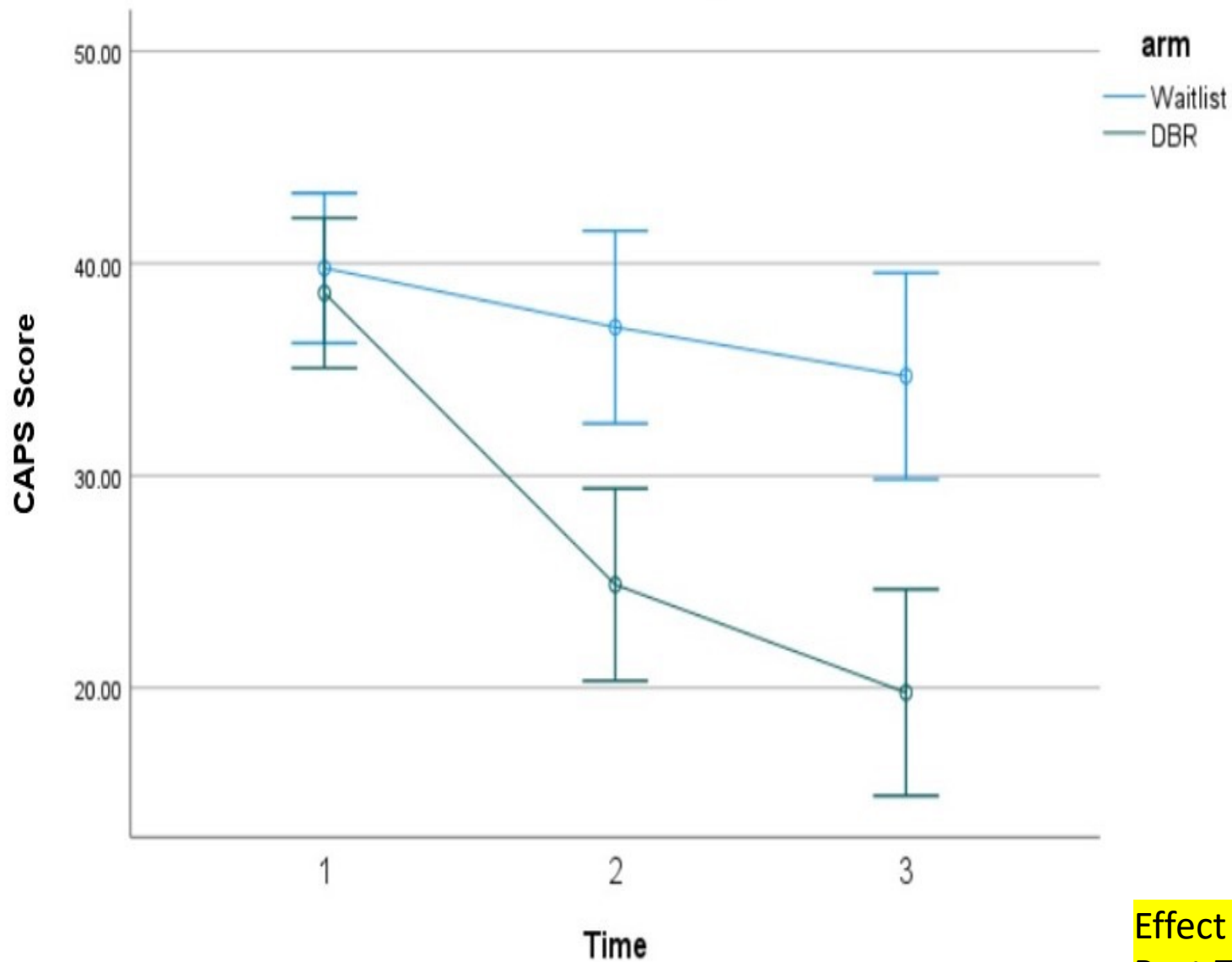
- 8 Sessions of online DBR vs. Waitlist
- Clinical assessments pre/post
- 7Tesla fMRI assessment pre/post

Interim Findings

(n=23 DBR;
n=23 waitlist)

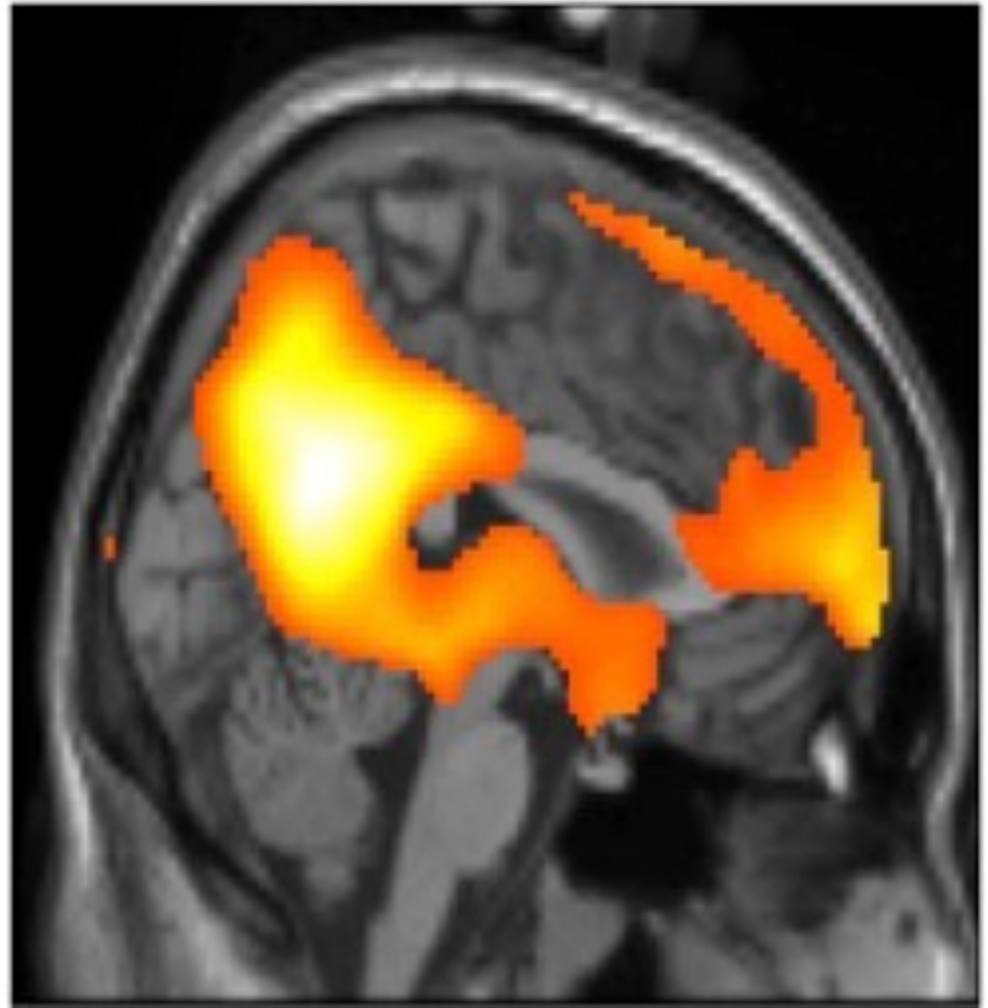


PTSD Severity



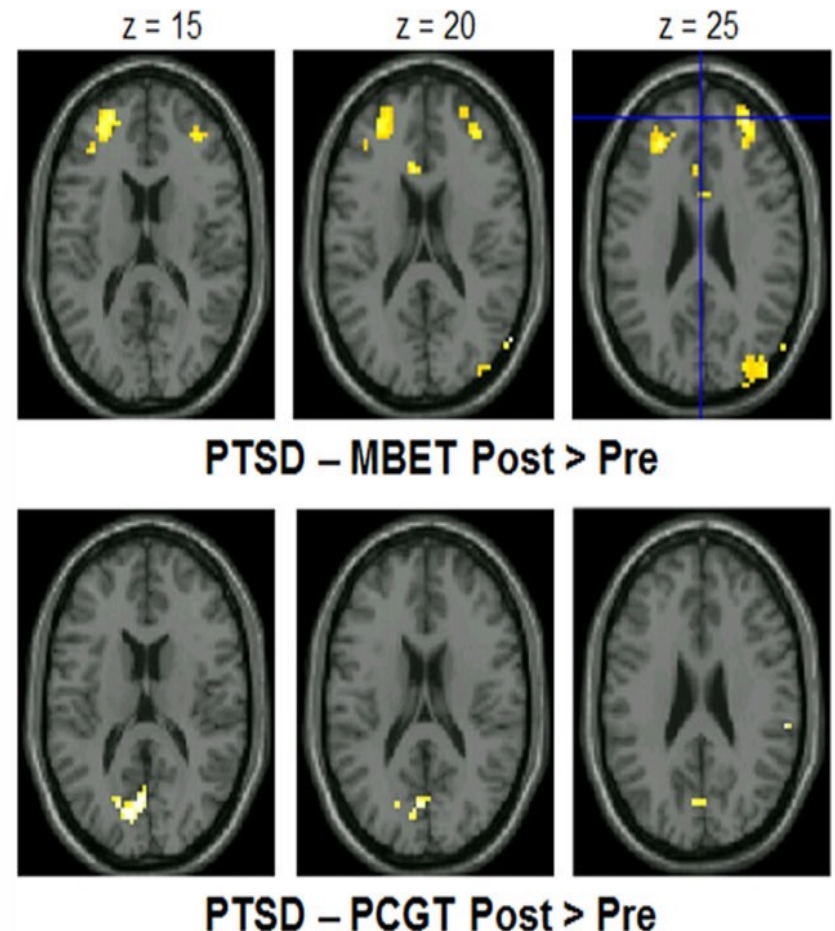
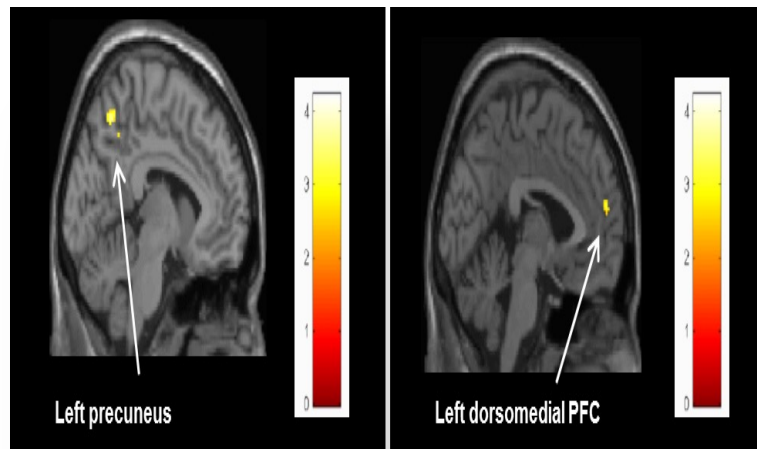
Effect Size:
Post-Treatment: 1.09
3-Month Follow-up: 1.28

Restoring
the
Default
Mode
Network
at Rest/
Off Task...



Uncoupling
the Default
Mode
Network
from the
Reptilian
Brain/PAG...





Restoration of the Default Mode Network After Treatment

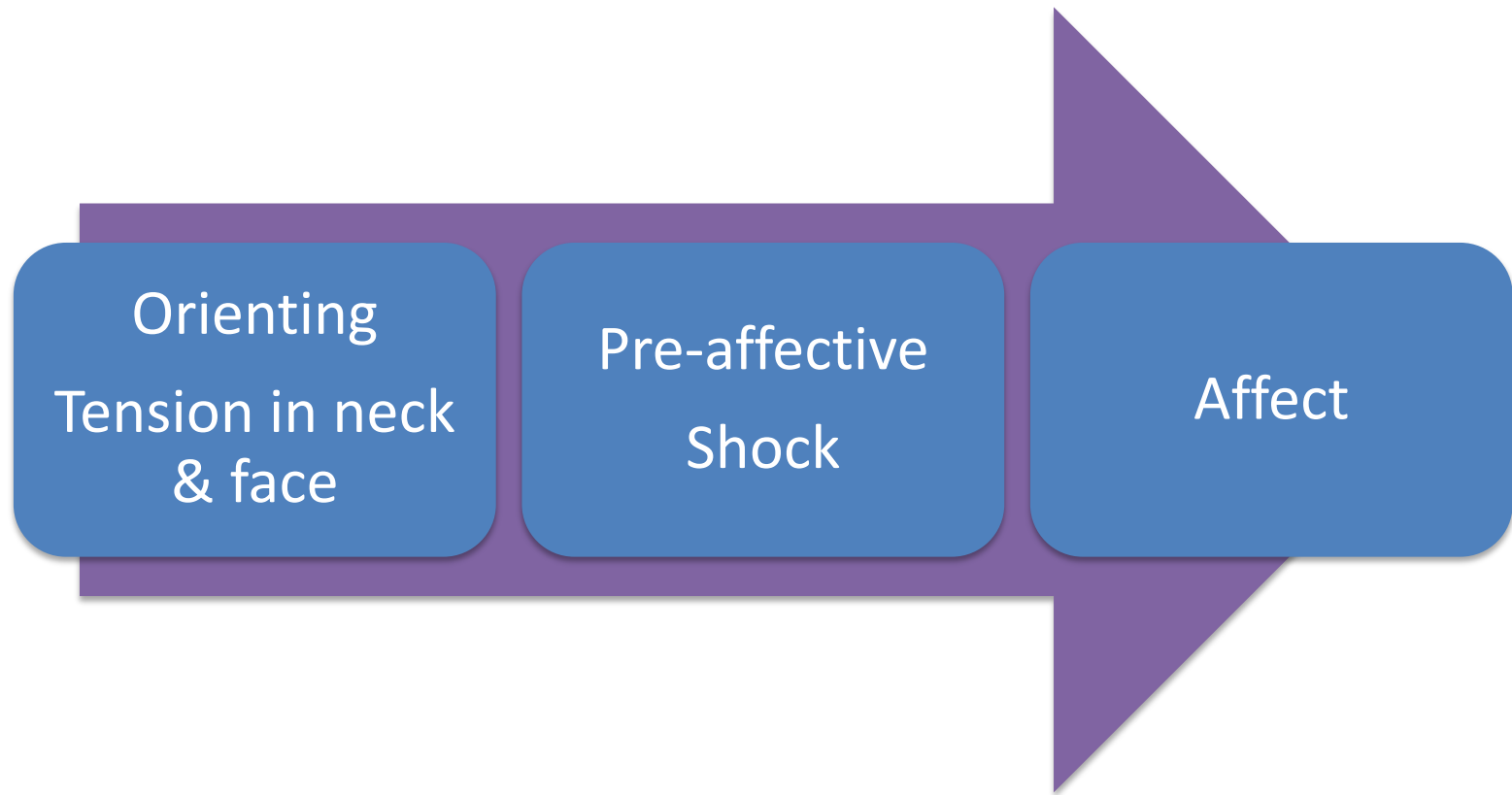


Feeling Alive Without Threat

“It’s strange.
I feel lighter all over my body.
I feel joy- real joy...
I feel alive!”



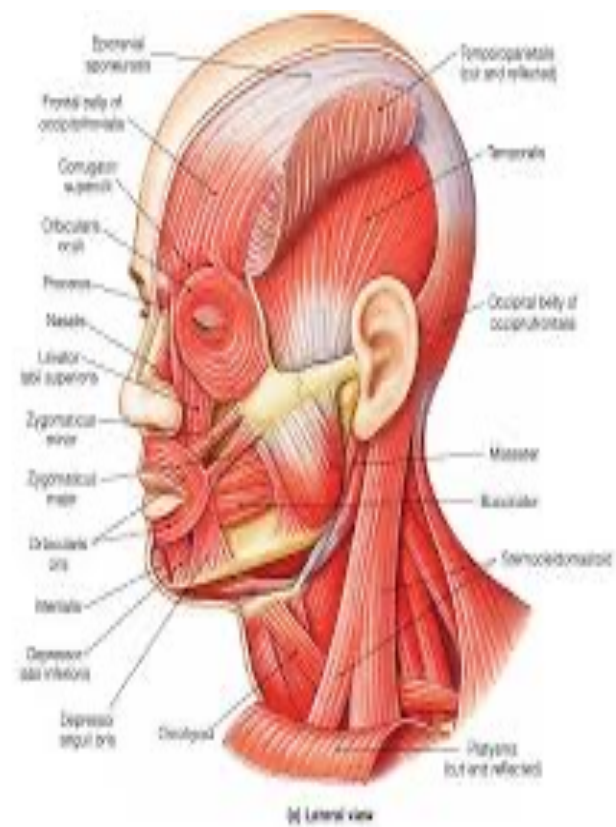
Thank You!






Orienting

- Orienting self in space
- Orienting to the trigger: Now, bring up the trigger (be specific, e.g., look on face)





Pre-affective Shock

- Frequently associated with shoulder tension, tension behind the eyes, or the experience of electrical shock throughout the body



When Do We Process Affect?

- Once a good anchor in the orienting tension has been established and tensions frequently associated with shock have resolved processing of affect can begin



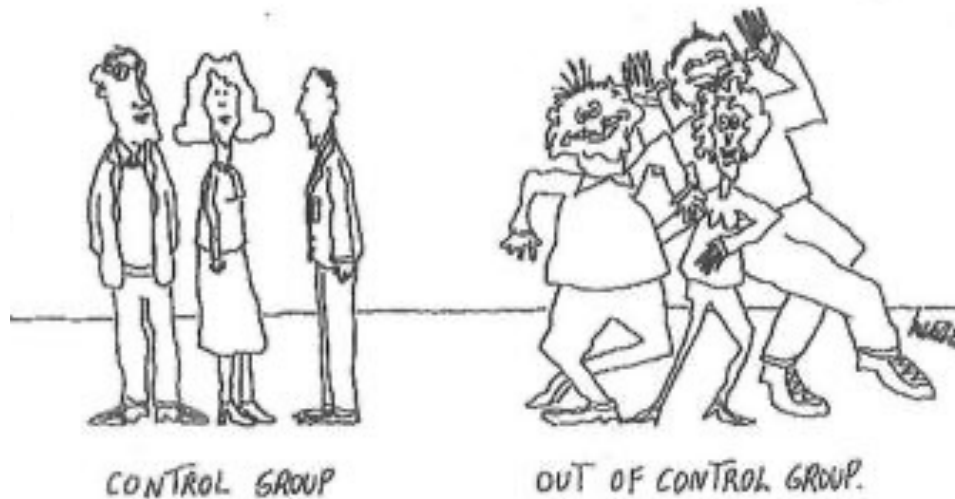
Affect

- Becoming aware of any raw emotions in the body
- Once emotions have been identified, “Now step into that mixture of tensions and emotions endorsed, and notice what’s happening in your eyes, neck and head, and body...”



New Perspective

- Becoming aware of new perspectives
- Once orienting tension, pre-affective shock, and emotions have been processed ask client to complete the statement “I am ...”



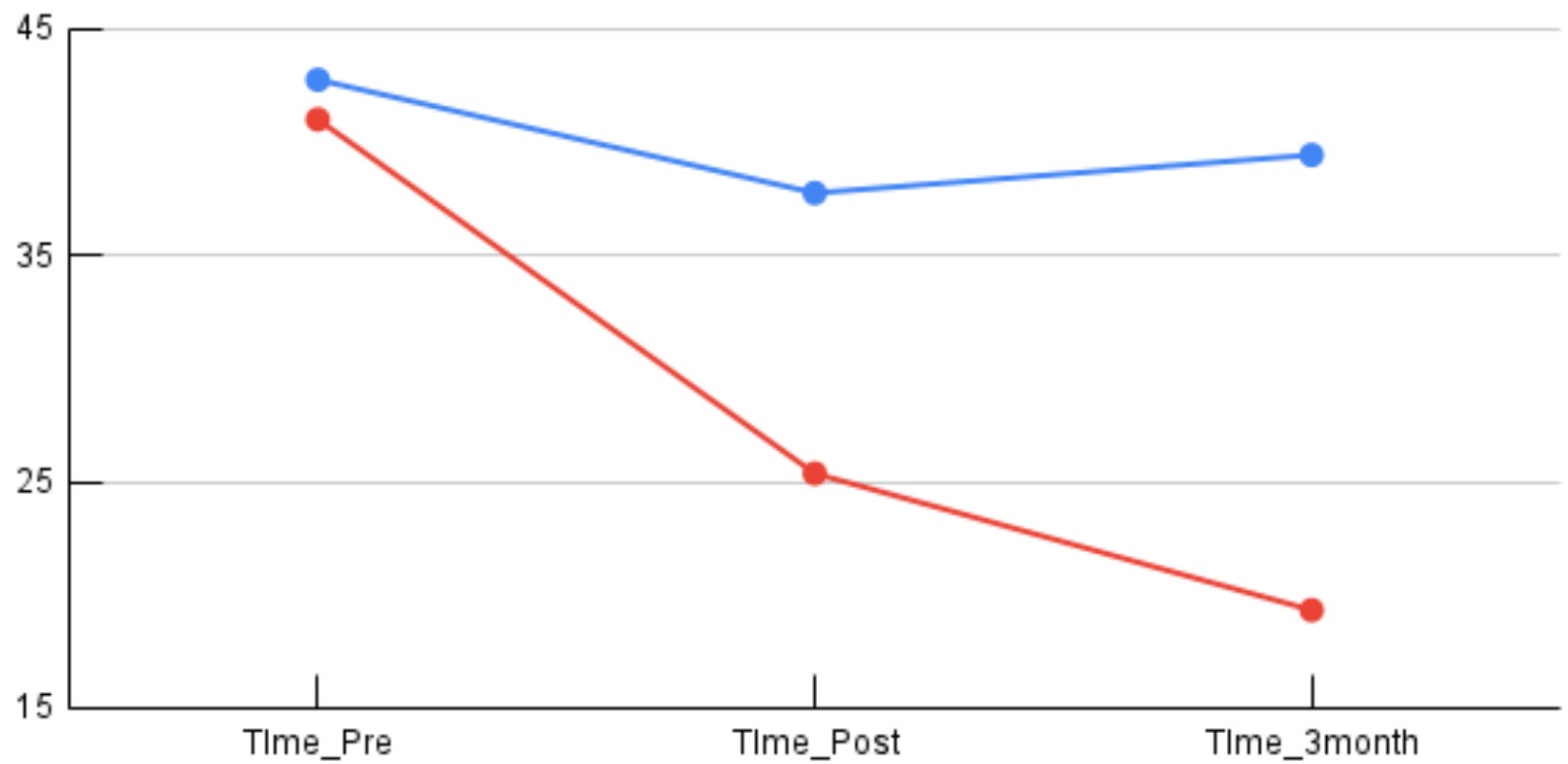
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Preliminary Findings



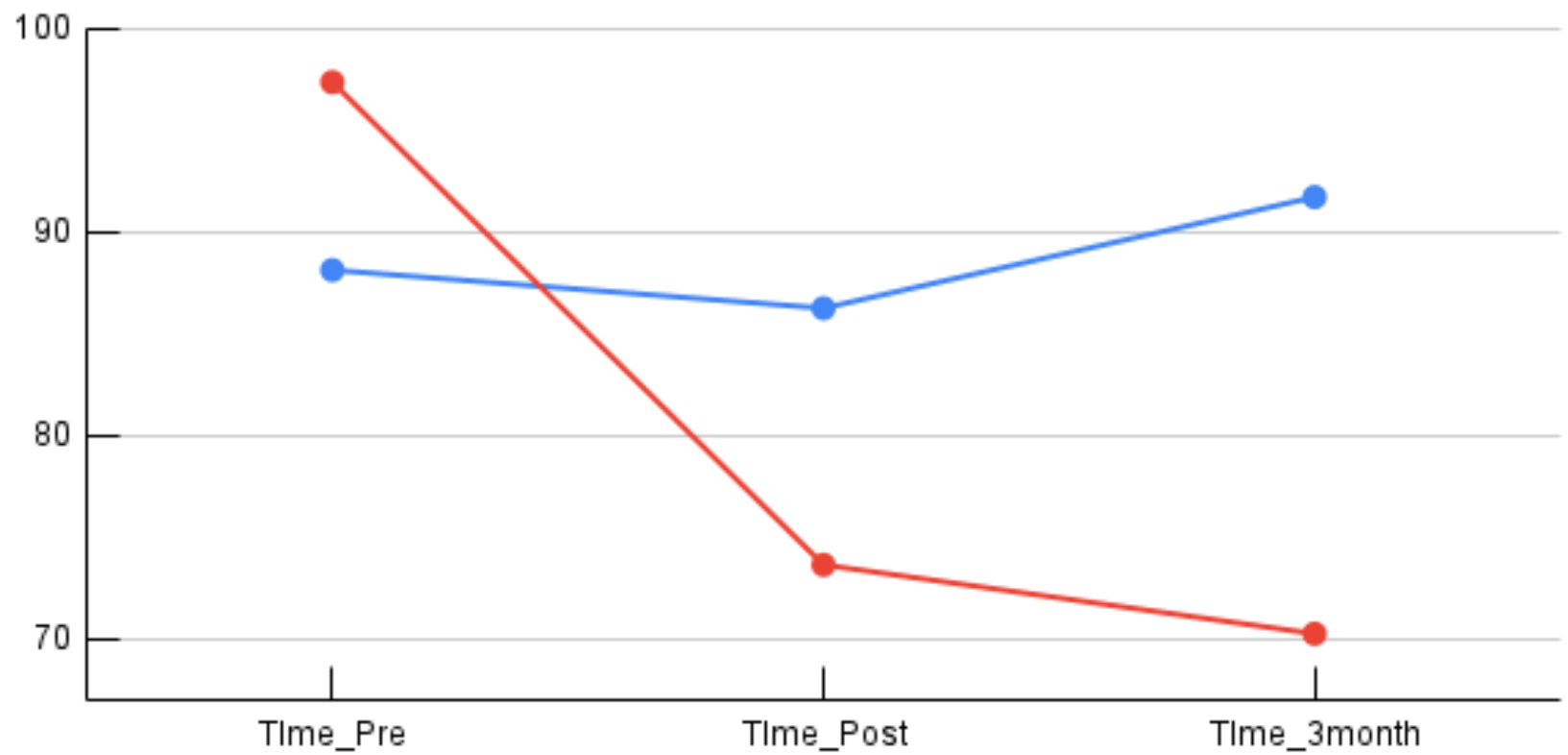
Means of PTSD

● WL ● Active

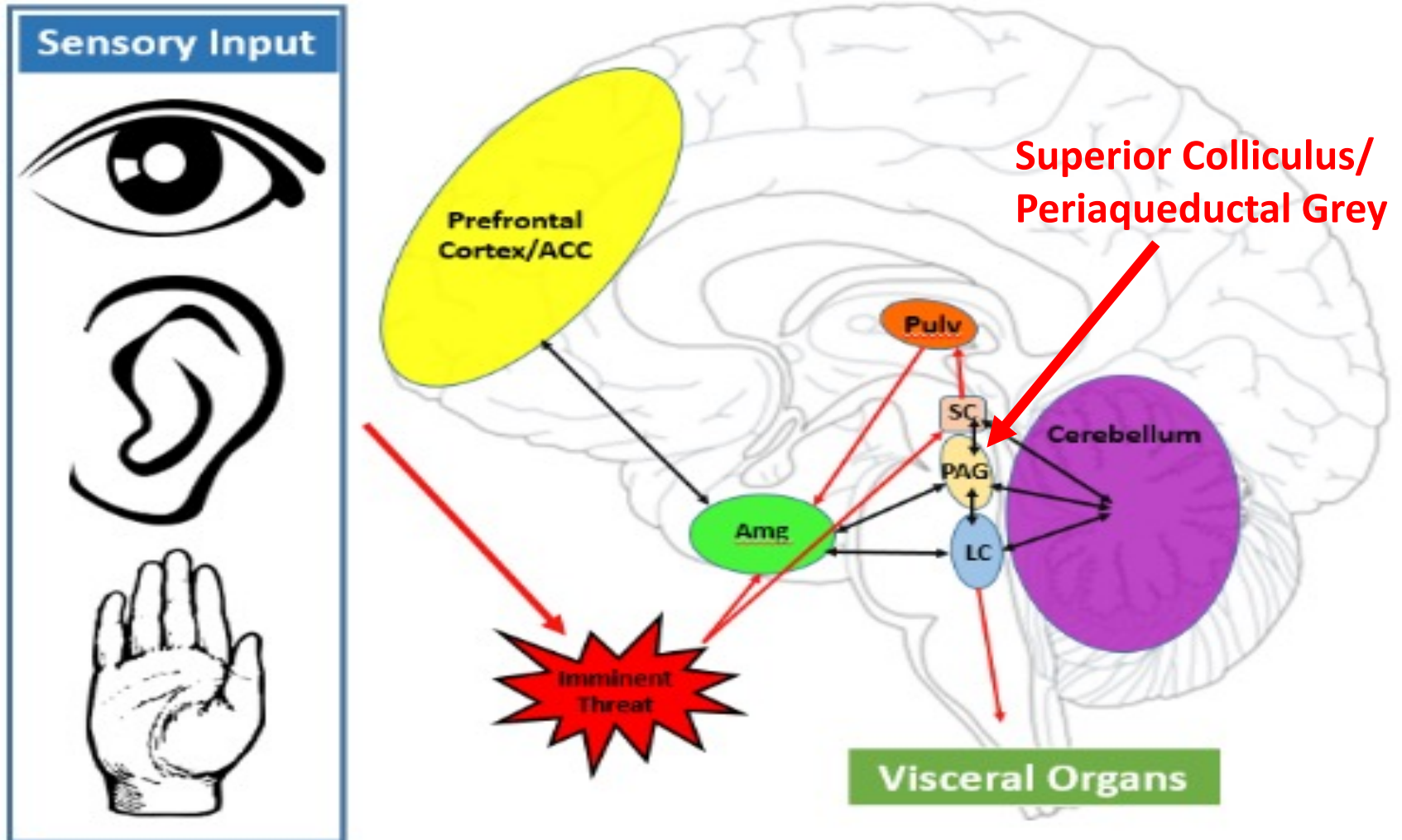


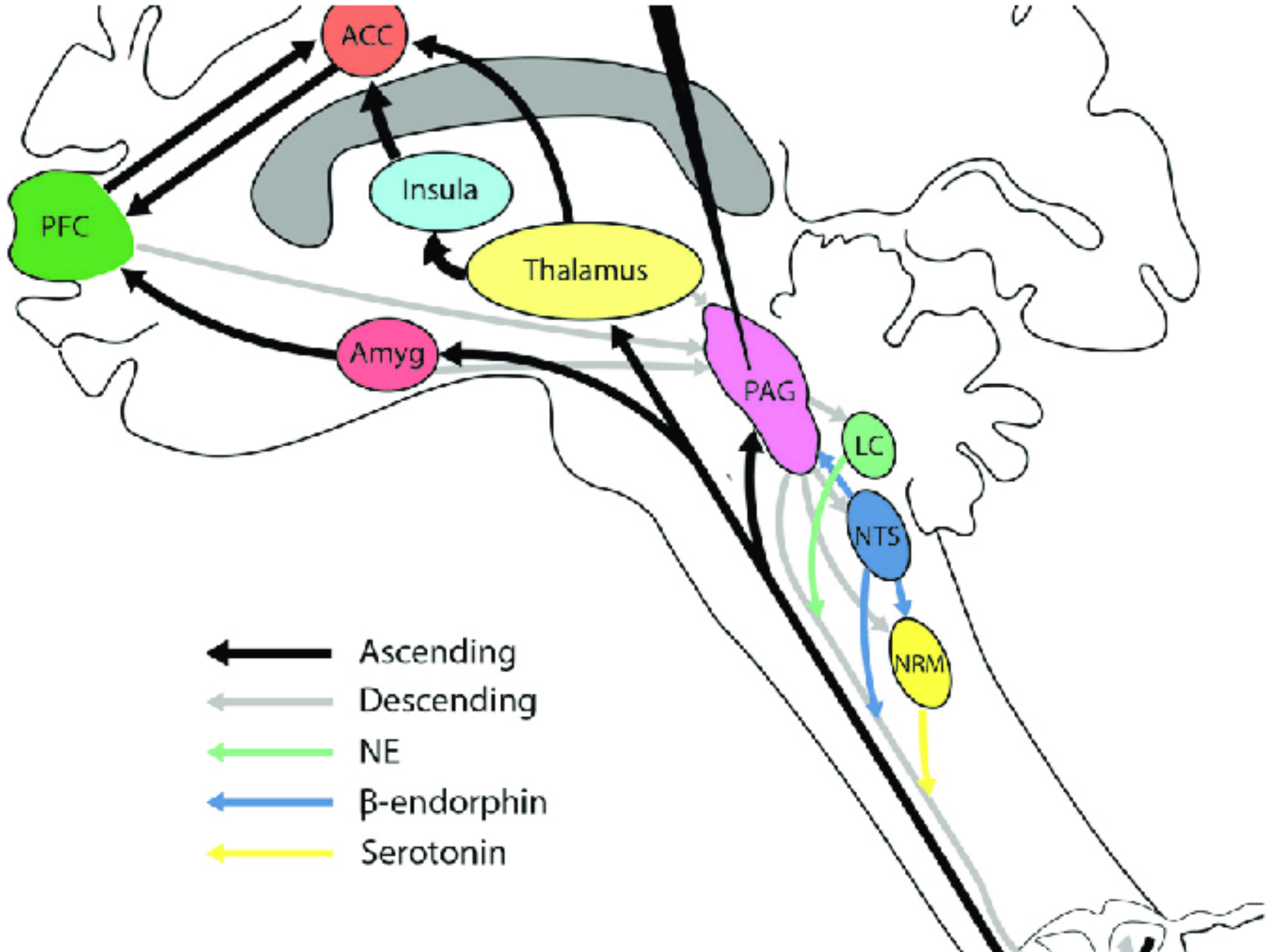
Means of DERS

● WL ● Active



Innate Alarm & Connection System





Orienting Response





- The tendency to approach others for connection involves a system which readily engages defensive responses if there is any threat experienced in the interaction.

“... Trials of the first-line trauma-focused interventions CPT and prolonged exposure have shown clinically meaningful improvements for many patients with PTSD. However, nonresponse rates have been high, many patients continue to have symptoms, and trauma-focused interventions show marginally superior results compared with active control conditions. There is a need for improvement in existing PTSD treatments and for development and testing of novel evidence-based treatments, both trauma-focused and non–trauma-focused”.

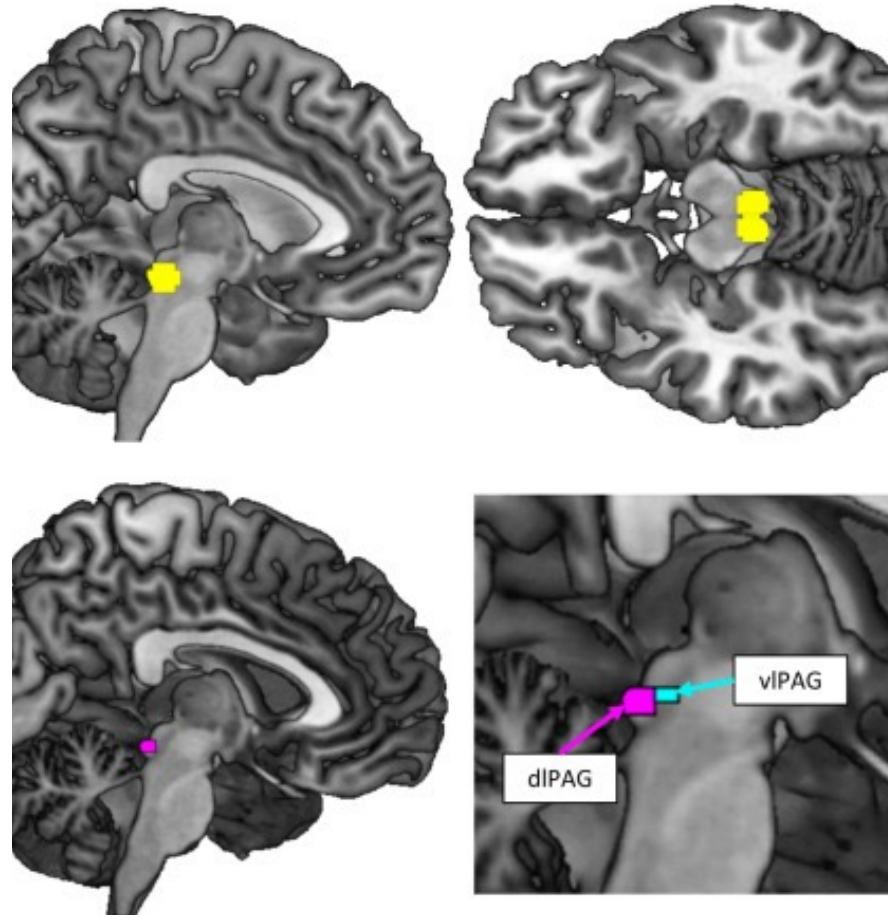
PAG: Where Arousal Meets Affect

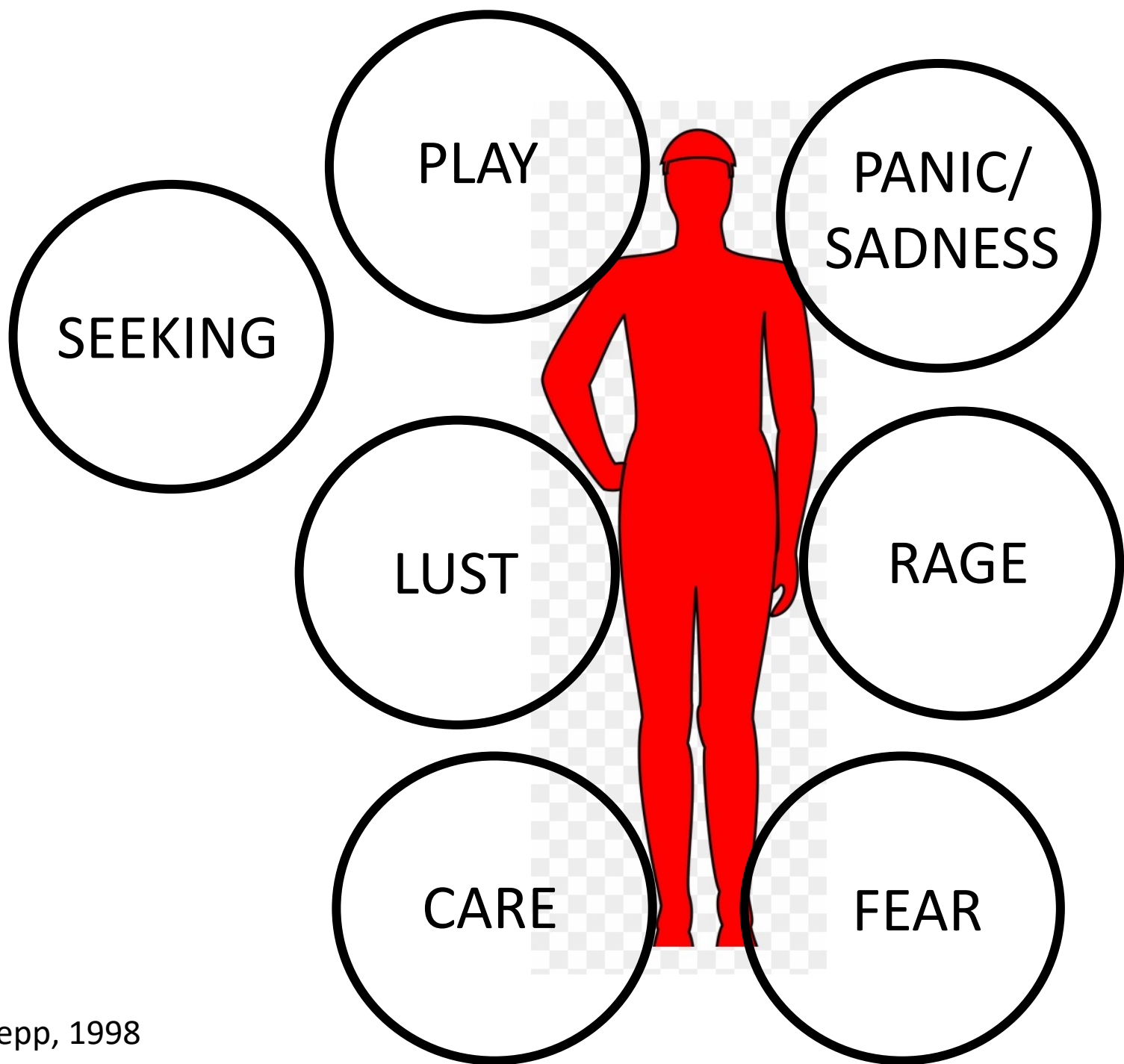
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Self Harm

All Just Attention Seeking?

Or is it related to seeking the other?



It's not
me.
It's my
brain.

