

Polyvagal Theory Evidence #1

Rescuing Hug

This is a picture from an article called "The Rescuing Hug". The article details the first week of life of a set of twins. Apparently, each were in their respective incubators, and one was not expected to live. A hospital nurse fought against the hospital rules and placed the babies in one incubator. When they were placed together, the healthier of the two threw an arm over her sister in an endearing embrace. The smaller baby's heart rate stabilized and her temperature rose to normal.



Nervous System Overview

Central Nervous System

Processing Information
Brain & Spinal Cord

Peripheral Nervous System

A highway which allows signals to travel between the CNS and the body's receptors and effectors.

Cranial Nerves
Spinal Nerves

Sensory Division

Motor Division

Exteroceptive

"The Five+ Senses"
"7th Sense" (?)

Interoceptive

Proprioception
Vestibular Sense

AUTONOMIC NS^{*}

Regulates Muscles & Glands
Smooth & Cardiac Muscles
No Conscious Control (?)

Somatic NS

Voluntary control
Striated Muscles (Skeletal)

Social

Medulla

(CNs V, VII, IX, X, XI)

Sympathetic

Thoracic & Lumbar

Neurotransmitter: Acetylcholine
at ganglion

Norepinephrine at postganglionic
synapse with target muscle or
organ

Parasympathetic

Medulla

(CNs III, VII, IX, X)

Sacrum

Neurotransmitter:
Acetylcholine at ganglion and
target organ or muscle

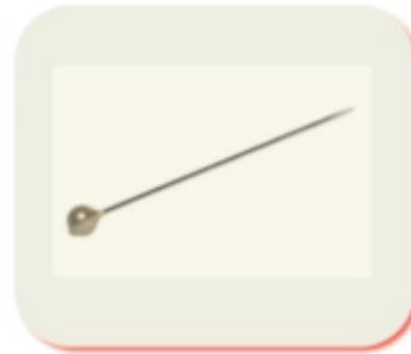
Enteric NS

*Primitive "Gut
Brain"*

*100 million
neurons!*

Priming in amnesia

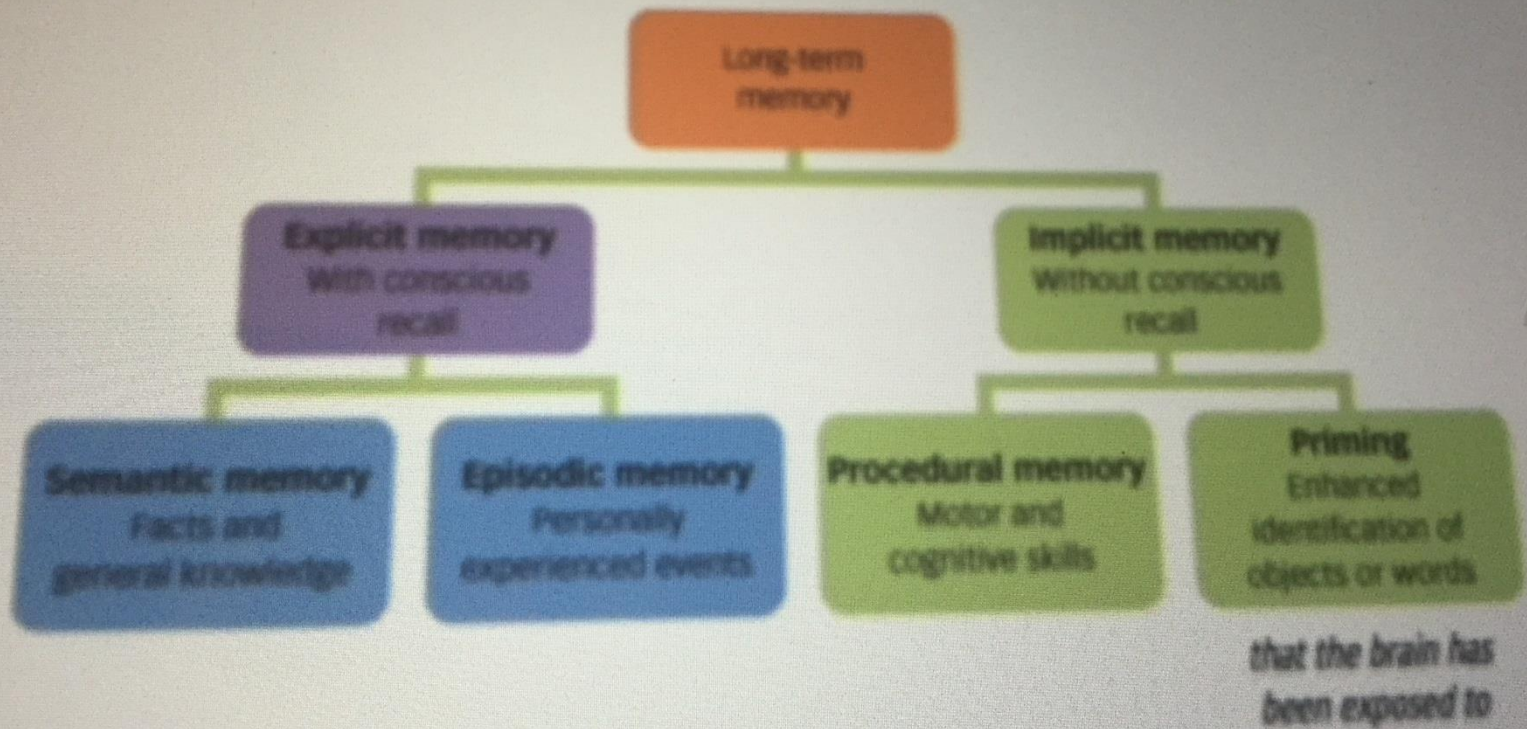
The pin of Dr Édouard Claparède



In 1911, studied an amnesic woman who never could recall seeing him before

Memory systems

Fractionation of long-term memory



Tres disciplinas fundamentan este nuevo enfoque en Psicoterapia

- **Neurociencias**

- Neuroimagen (fmri, Pet, etc...)

- **Psicopatología Evolutiva**

- Estudio del impacto de experiencias adversas en el desarrollo del cerebro y la personalidad

- **Neurobiología Interpersonal**

- El estudio de como nuestra conducta influencia las emociones, la biología y los estados mentales a nuestro alrededor.

Por lo tanto...

- Información descendente.
- Información ascendente.
 - Permitir al cuerpo tener experiencias que contradigan profunda y visceralmente la indefensión, rabia o colapso que resulto del trauma.

PARASYMPATHETIC NERVES

"Rest and digest"

Constrict pupils

Stimulate saliva

Slow heartbeat

Constrict airways

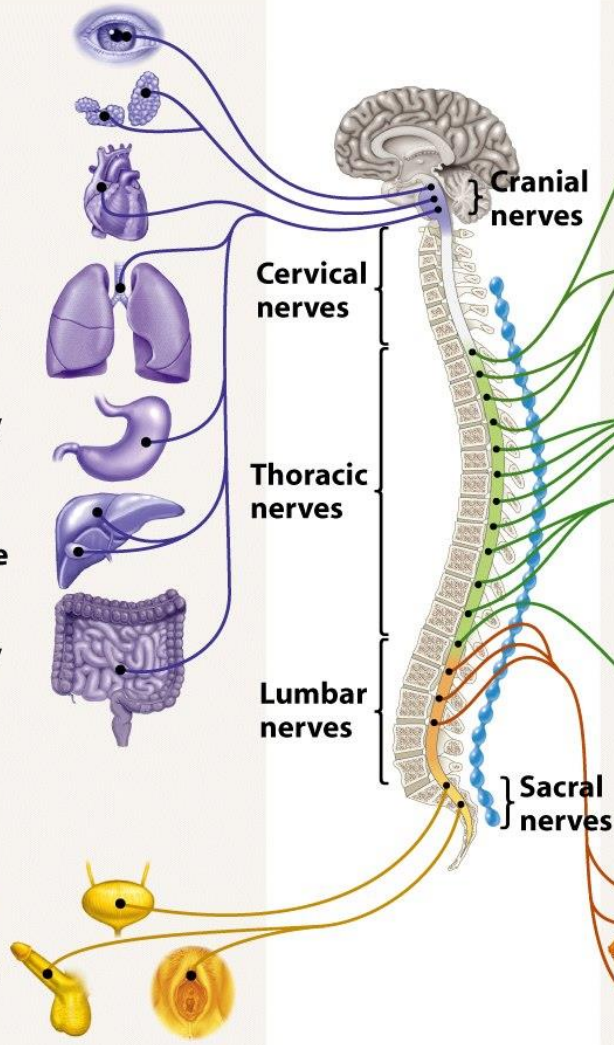
Stimulate activity of stomach

Inhibit release of glucose; stimulate gallbladder

Stimulate activity of intestines

Contract bladder

Promote erection of genitals



SYMPATHETIC NERVES

"Fight or flight"

Dilate pupils

Inhibit salivation

Increase heartbeat

Relax airways

Inhibit activity of stomach

Stimulate release of glucose; inhibit gallbladder

Inhibit activity of intestines

Secrete epinephrine and norepinephrine

Relax bladder

Promote ejaculation and vaginal contraction

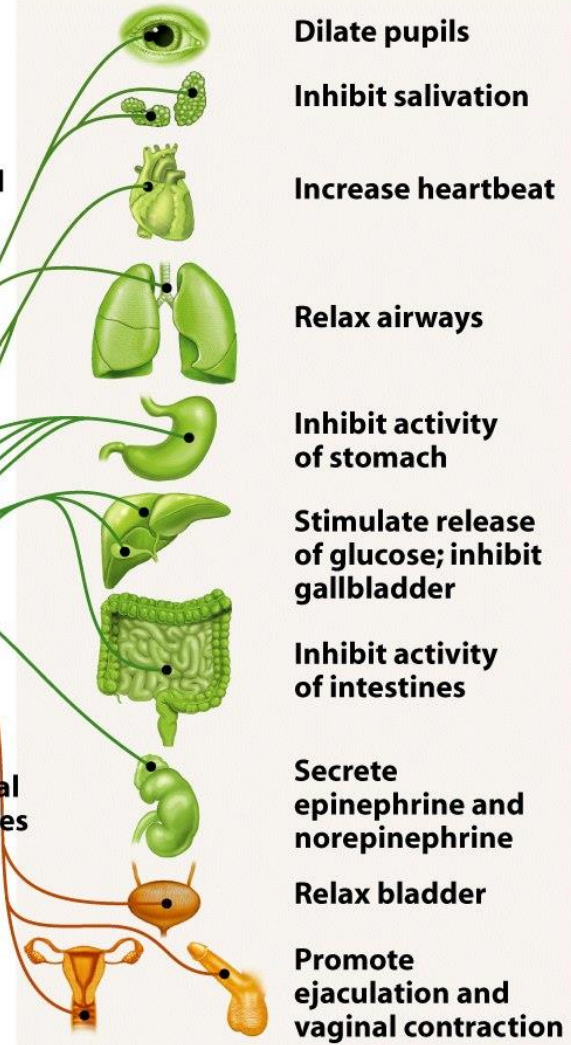
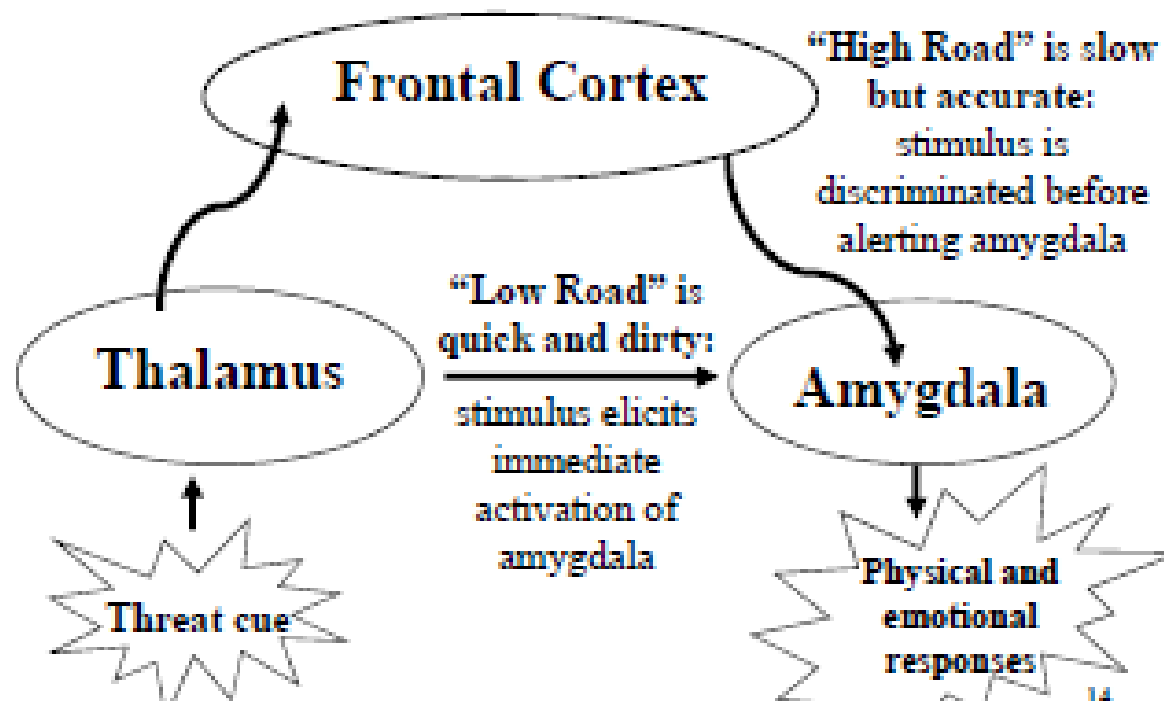


Figure 45-20 Biological Science, 2/e
© 2005 Pearson Prentice Hall, Inc.

SURVIVAL REQUIRES BOTTOM-UP RESPONSES

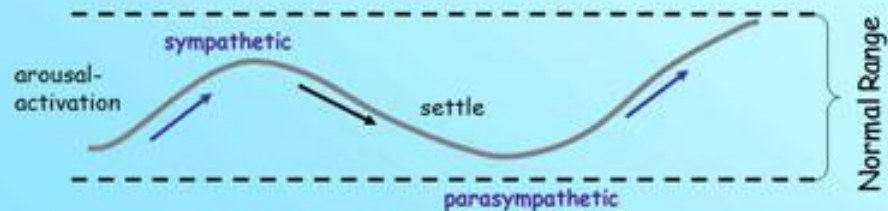
The “High” and “Low” Roads to Fear

Ogden, 2005; Fisher, 2008

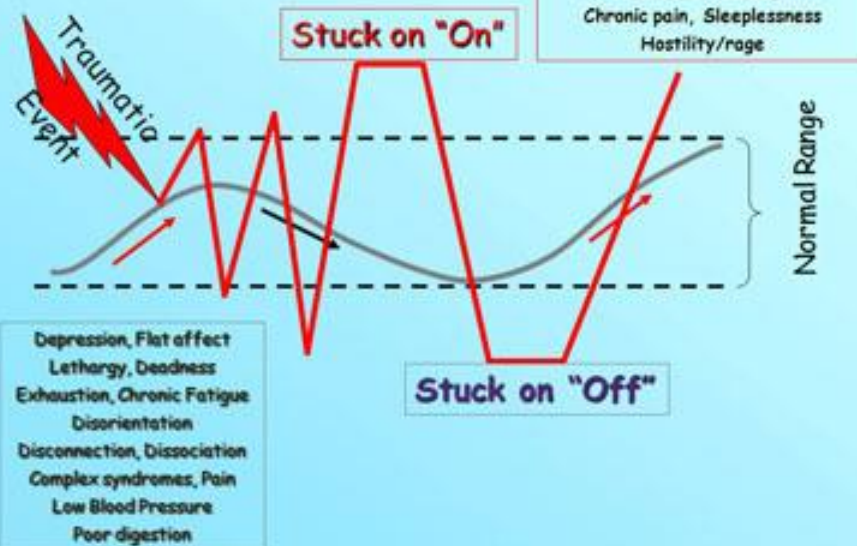


Le Doux, 2002

A Healthy Nervous System



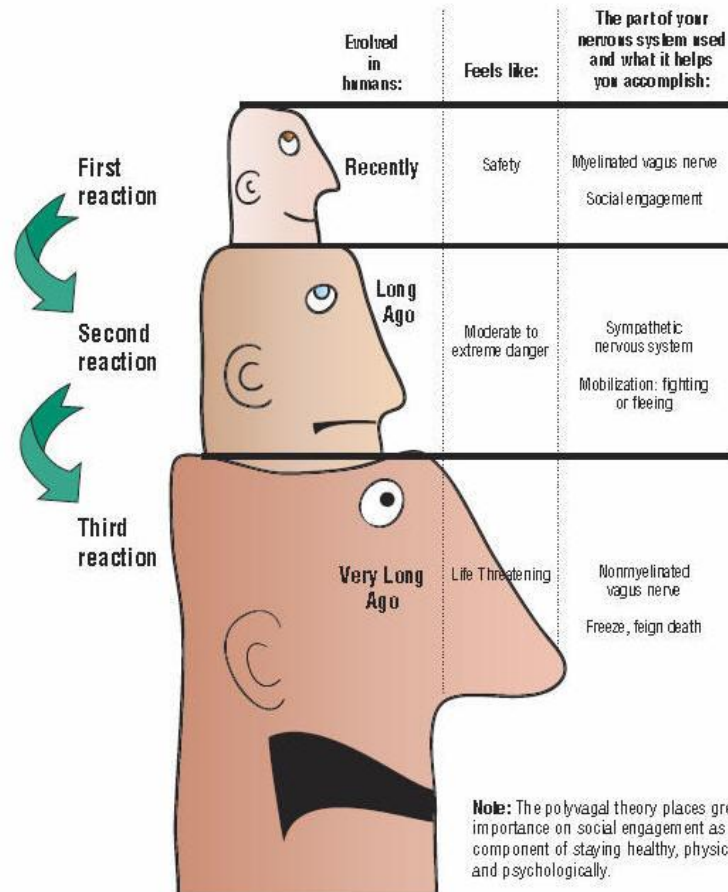
Symptoms of Un-Discharged Traumatic Stress



POLYVAGAL THEORY

By Ravi Dykema

Events trigger you to react. If your first reaction doesn't make you feel safe, you revert to the second, then the third:



Jackson's Theory of Dissolution

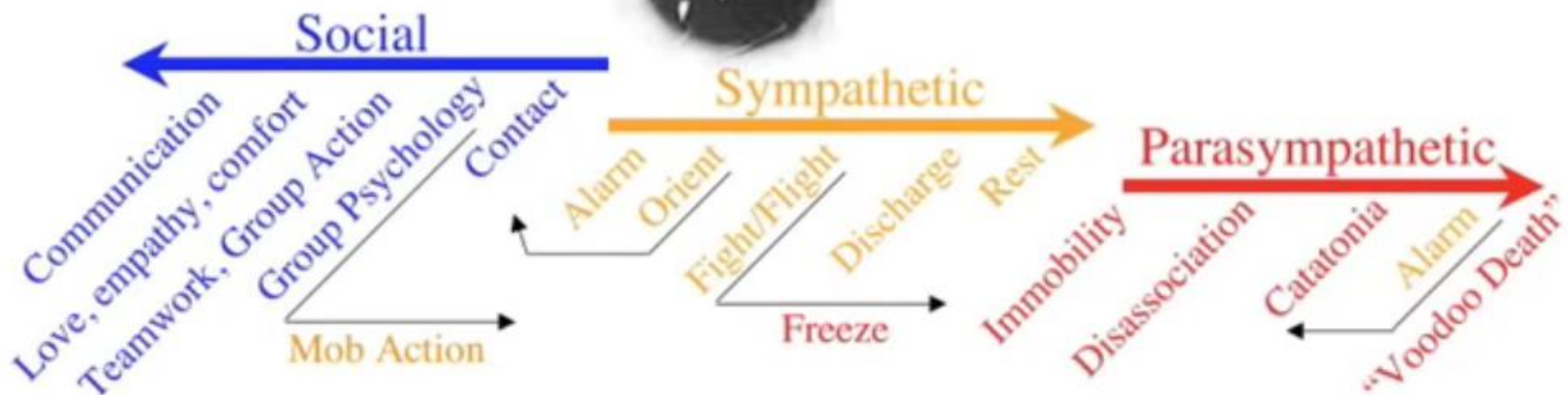
"The higher nervous system arrangements inhibit (or control) the lower, and thus, when the higher are suddenly rendered functionless, the lower rise in activity."



–John Hughlings Jackson (1835-1911)

Father of English Neurology

Quoted by Stephen Porges 11/01



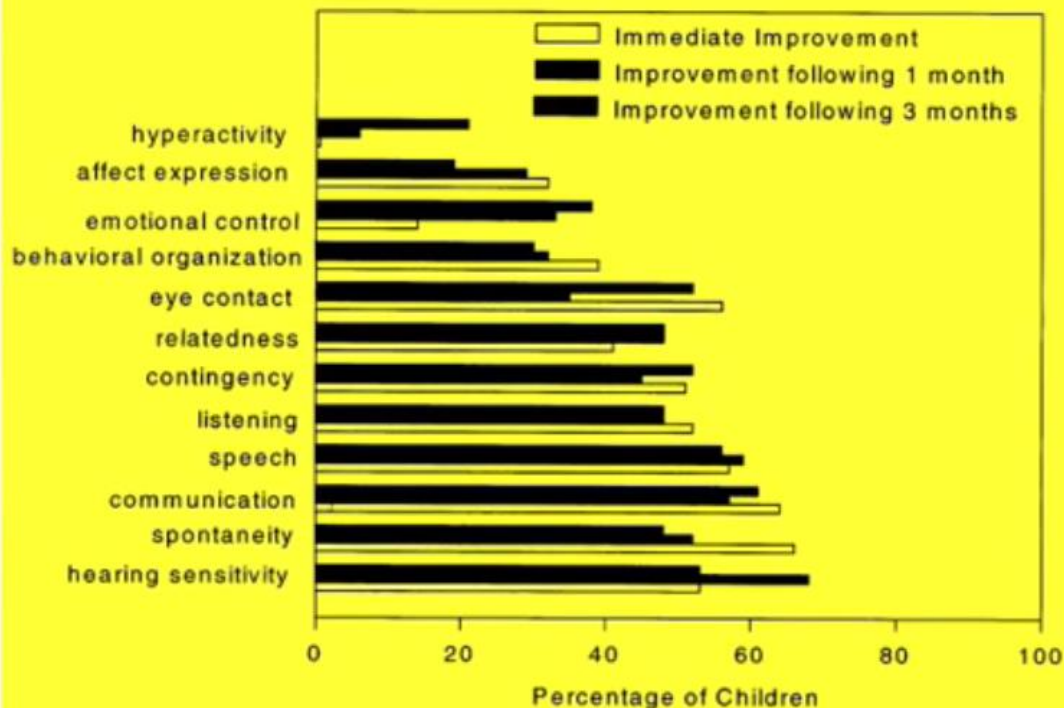
We play our **newest, best card** first, if that doesn't work (or has not worked in the past as determined by the amygdala), we try our **older, second card**. If that doesn't work, we play our **oldest, last card**. If that doesn't work we are in extreme danger of death.

Porges Autism Study

Subjects had
Social Nervous
System stimulation
via middle ear
muscles (listening
to specially
designed sound)
for 5 sessions of
45 minutes each

*This slide is from
the Porges
Boulder
presentation 2/01*

Follow-up Assessments



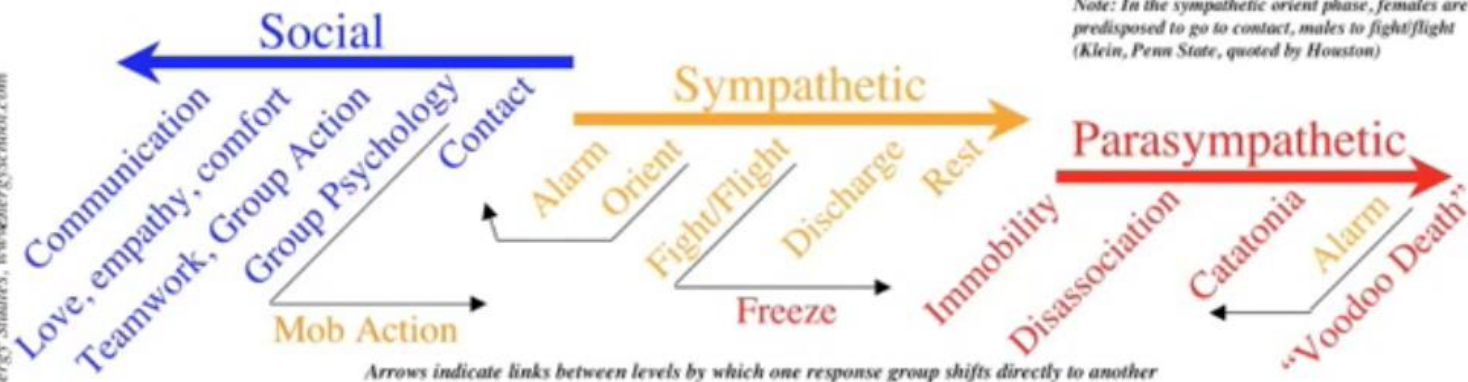
Stress Responses of the Autonomic Nervous System

Stage One: A primitive passive feeding and reproduction system creating a metabolic baseline of operation to manage oxygen and nutrient-rich blood.

Stage Two: A more sophisticated set of responses enabling mobility for feeding, defense and reproduction via limbs & muscles.

Stage Three: A sophisticated set of responses supporting massive cortical development (i.e., enabling maternal bonding (extended protection of vulnerable immature cortex processors) and social cooperation (language and social structures) via facial functions).

Note: In the sympathetic orient phase, females are predisposed to go to contact, males to fight/flight (Klein, Penn State, quoted by Houston)



Social Indicators:

- Eye contact
- Voice contact
- Feeling of sympathy
- Sensation of face, mandible, lips & mouth, throat; Warmth, tingling in facial areas
- Temporal bone shapes
- Interpersonal awareness arises- thought of a person, etc. Sense of interpersonal contact via eyes, ears, mouth, arms
- Feeling tones of sadness, wavelike forms uprising
- Upward sensation?

Neurotransmitters: Oxytocin, Vasopressin

Sympathetic Indicators:

(Rothschild p. 48)

- Faster respiration
- Quicker heart rate (pulse)
- Pupils dilate
- Pale skin color
- Increased sweating
- Skin cold (possibly clammy)
- Digestion & peristalsis decreases

Activates during positive or negative stress states, including sexual climax, rage, desperation, terror, anxiety/panic, trauma

Neurotransmitters: Cortisol (CRF), Adrenaline, Epinephrine, Noradrenaline & Norepinephrine

Parasympathetic Indicators:

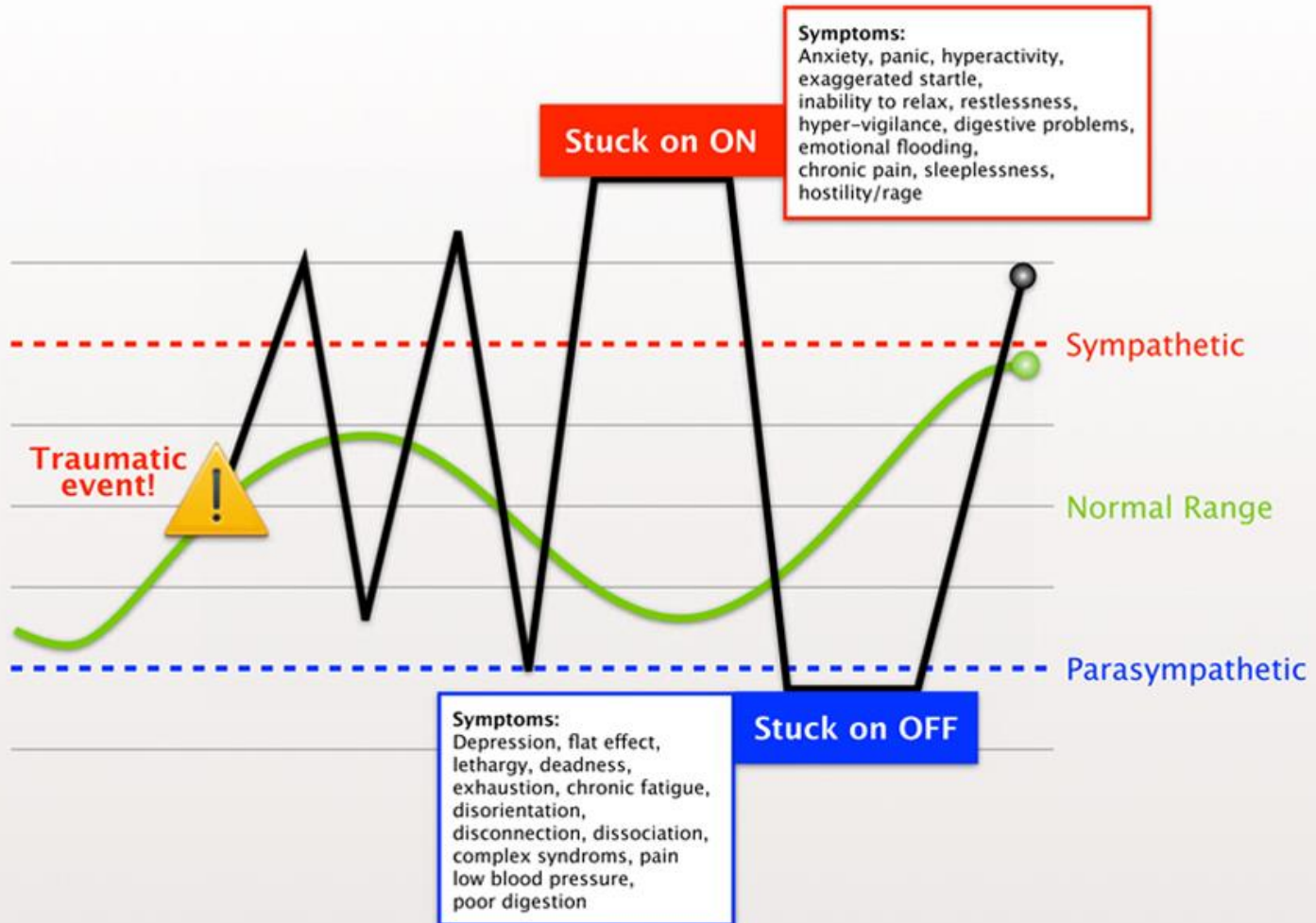
(Rothschild (p. 48)

- Slower, deeper respiration
- Slower heart rate (pulse)
- Decreased blood pressure
- Pupils constrict
- Flushed skin color
- Skin dry (usually warm) to touch
- Digestion & peristalsis increases

States of activation include: rest and relaxation, sexual arousal, happiness, anger, grief, sadness

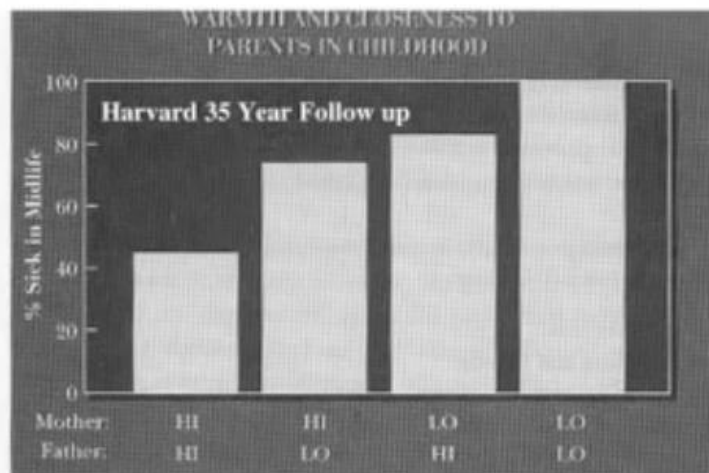
Neurotransmitters: Serotonin, Dopamine, Endorphin

Symptoms of Un-Discharged Traumatic Stress



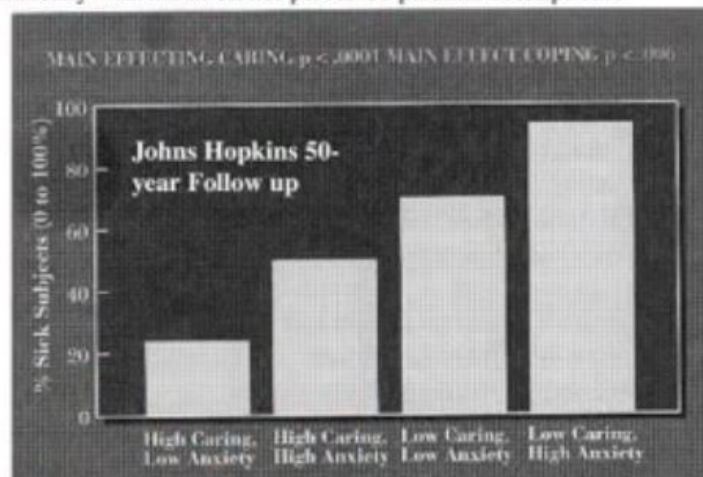
Social Nervous System Studies

Dean Ornish, Love & Survival, pp. 34-51



Above Left: Schwartz, Russek et al acquired data on healthy students, to determine their perception of parental warmth & closeness. 35 years later the subjects' medical records were studied. Medical problems correlated dramatically with much-earlier perceived parental descriptions.

Right: 1,000 medical students were evaluated for their perception of parental environment with two variables, warmth and anxiety. 50 years later their medical record were studied. Medical problems correlated dramatically with much-earlier perceived parental descriptions.



Below: heart surgery patients were evaluated for recovery group participation and religious beliefs. Survival correlated strongly with these variables.

