



# Polyvagal Theory

Clinical Application in Somatic Work with Children

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WE CAN'T WAIT VI

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# OUTLINE

- Polyvagal Theory
- Arousal Chart
- Somatic Psychotherapy Theory
- Somatic Techniques

# Polyvagal Theory Overview

- Autonomic Nervous System - old and new view
- Neuroception - the subconscious detection of safety or threat.
- Hierarchy of 3 parts of nervous system in normal states
- Hierarchy of 3 parts of nervous system under stress

# ANS Old and New: Overview

- OLD MODEL: Two: Parasympathetic (PNS) or Sympathetic (SNS) reciprocate like on a seesaw, switched on/off, like a light.
- NEW MODEL: Three: hierarchical flow (try evolutionarily newest (SES) first), phylogenetically formed, Mammalian aspect is "Social Engagement System" (SES).
- SES helps mammals survive by engaging in protection, attraction, and group bonding.
- Important to assess and appreciate states (PNS, SES, SNS) for different purposes (immediate or long term coping style).
- GOAL: help caretakers facilitate movement back to SES (W.O.T. or optimal arousal) for children. SAFETY or detection of safety is the ONLY road to SES. Once in SES, children engage comfortably, play, can best learn and create.



# Neuroception



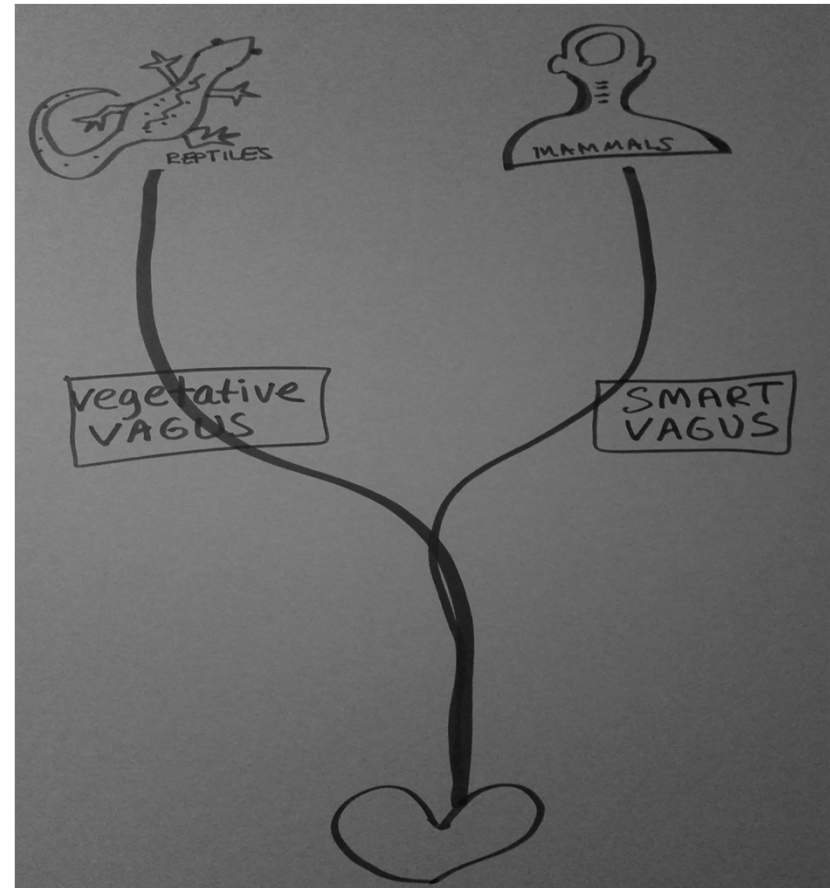
- A subconscious system for detecting threats and safety at a glance.
- Neural circuits distinguish whether situations are safe, dangerous, or life threatening.
- IS THAT A SNAKE OR A STICK IN THE ROAD?
- Faulty neuroception: inability to inhibit defense in safe environment and/or activate defense in risky environment.

Evolution of the  
Autonomic Nervous System  
*"The Ultimate Survival Machine"*



# Ventral Vagal & Dorsal Vagal Complex

- 10<sup>th</sup> cranial nerve is the origin of vagus.
- Smart, mylenated, ventral (front of body) vagus (VVC) relates to SES -mammals  
SES, primates:  
sophisticated SES
- Vegetative, unmylenated, dorsal (back) vagus (DVC) relates to PNS- reptiles, primitive.



## Poster of body in 3 colors

- SES red in front (ventral) –  
engage voice, eyes, face, reach
- SNS gold backbone (dorsal) - run,  
fight, challenge
- PNS blue - rest, digest, freeze,  
dissociate



# Evolution of the Autonomic Nervous System

## *"The Ultimate Survival Machine"*

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).



*"Three neural circuits form a phylogenically ordered response hierarchy that regulates behavioral and physiological adaptation to safe, dangerous and life-threatening environments."*

*-Porges 8/05*

### Social

*"Love Transactions  
Social Structures & Hierarchies  
Language  
Empathy  
Contact"*

*Social Engagement occurs via eyes, ears, mouth, voice, touch, facial expression*

### Sympathetic

*Sexual Climax  
Recreational & Vocational Excitement  
Mobilization (food, fight/flight, sex)  
Heightened alertness & metabolism, muscular activity*

### Parasympathetic

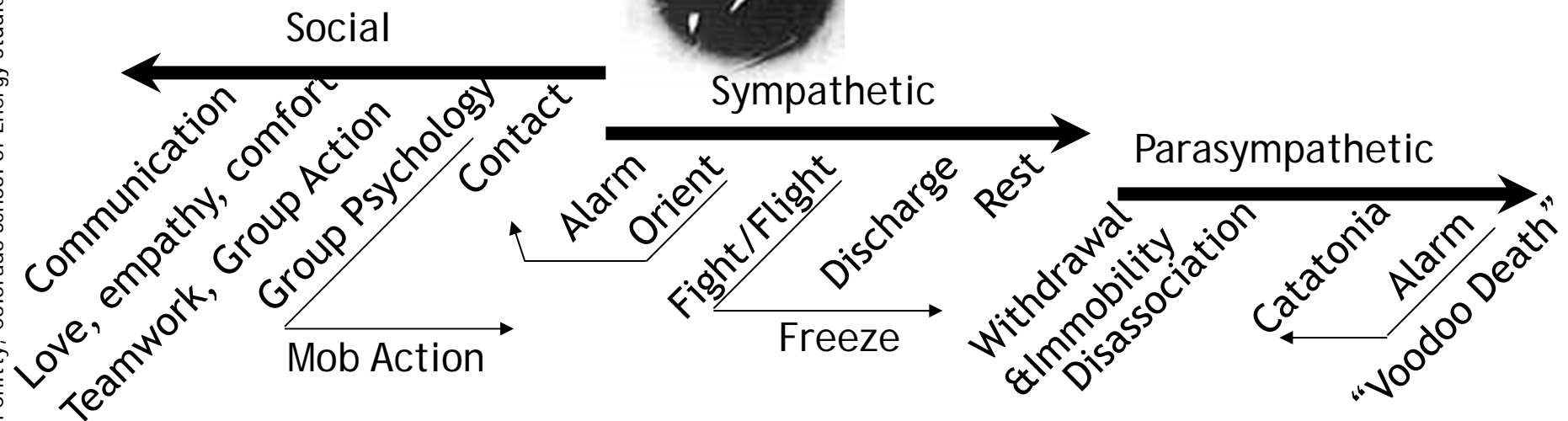
*Rest & Rebuild  
Meditative States  
Sexual Arousal  
Sleep (4 stages)  
Baseline Metabolism (Heart, Breath, Assimilation)*

# 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.

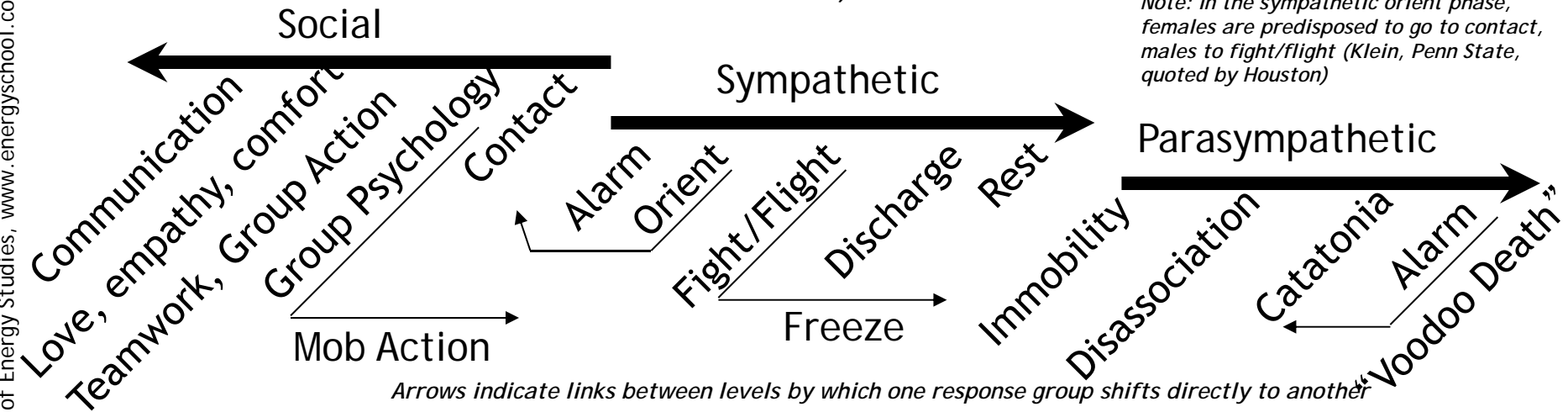
# Stress Responses of the Autonomic Nervous System

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

# THREAT & “THREAT”



A  
R  
O  
U  
S  
A  
L

Fear  
Stress  
Anxiety  
Overwhelmed

Stimulated  
Motivated  
Challenged  
Engaged

Boredom  
Alienation  
Helplessness

THREAT



# Somatic Psychotherapy Theory

- Brain and Trauma - (amygdala hijack, cortisol, Bruce Perry)
- Body and Trauma - energetic homeostasis in developmental (chronic) or shock trauma
- Body manifests adaptive responses for protection
- Environmental movement and motility of affect
  - Group Exercise: Arm Reach
  - Case of 11 month old baby

# Polyvagal and Body-based Interventions

- Overall therapeutic goal is to re-establish SES, i.e. “reclaim a natural, childlike state of joy...” (Lowen)
- Identify state of ANS by observation of body and interpersonal reactions. (SNS, PNS, or SES)
- Use Bioenergetic Interventions to help move energy from one state to the other. To up (SES,SNS) or down regulate (SES,PNS), activate deep breathing. Notice where energy is stuck. Activate emotional awareness and/or expression to move blocked affect. Be aware of your voice prosody and affect to encourage safety. Once affect moves through, the client will naturally move to SES. Somatic tools can help contain, discharge or shift affect.

# Somatic Psychotherapy Cases

- 1. CASE: 5 year old. " Mom needs me to be happy but I am mad." (hammering wooden balls)
- 2. CASE: *Inside Out* movie. 11 year old. "You need me to be happy but I am sad". (accessing sadness to re-engage)
- 3. CASE: "I am mad all the time". 7 year old. (matching, mirroring, expressing and containing)

# Implications for Clinicians

- Overall therapeutic goal is to re-establish the Social Engagement System
- If you can identify what state of the ANS the client is in you will have a road map to help them.
- It is important to convey to the client that wherever they are in the ANS is adaptive for them.
  - When the newer Social Engagement System fails, then the natural strategy is to go (automatically) to the SNS, and if not successful there, then to the PNS.
  - Psycho-education: Give clients a visual of the three branches. Can they recognize where they are?
    - If client is in PNS, you *may* want to introduce movement, e.g. squeeze and release muscle, as this helps move client into the SNS. Be aware of your voice prosody and facial expression to help invite client into the SES.



# References

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- Lowen, A. (1995) *Joy, Surrender to the Body and to Life*. Penguin
- Marucheau, L. (2015) Powerpoint for IPNB study group.
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- Panksepp, J. Biven, L. (2012) *The Archaeology of Mind: Neuroevolutionary Origins of Human Emotions*. New York: Norton.
- Porges, S. (2011) *The Polyvagal theory : Neurophysiological Foundations of Emotions, Attachment, Communication, Self-regulation*. New York: Norton.
- Siegel, D.J., Bryson, T. (2011) *The Whole-Brain Child*. Random House

# Additional resources

## some good multimedia follow-up

- <http://shrinkrapradio.com/>
- <http://brainsciencepodcast.com/>
- <http://www.neuropsychotherapist.com/>
- <http://www.nicabm.com/>
- <http://www.npsa.cz/>
- <http://www.viruscomix.com/floorplan.html>
- Youtube - Look up any of the key authors or ideas, such as polyvagal, neuroception, Stephen Porges, Rick Hanson, Bruce Lipton, Norman Doige, Kelly McGonigal, Bruce Ecker, John Chitty, Jaak Panksepp, Dan Siegel, Alexander Lowen, Tina Payne Bryson or Pat Ogden.