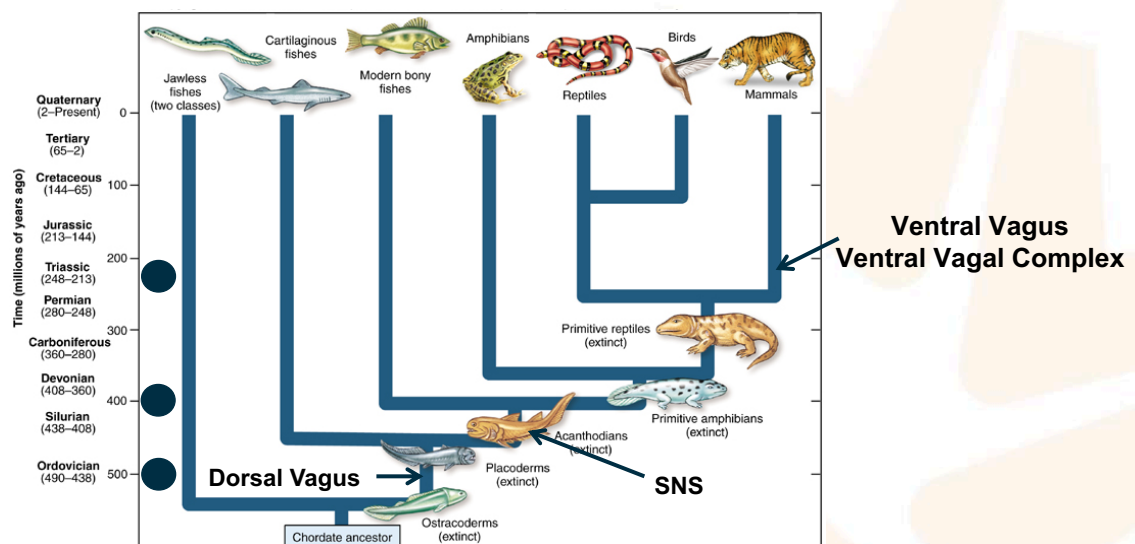


How Social Isolation Contributes to a Dysregulated Autonomic Nervous System

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 Founding Director, Traumatic Stress Research Consortium
 Kinsey Institute, Indiana University
 Professor Psychiatry, University of North Carolina

1

Evolutionary Journey to Sociality



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Ventral Vagal Social Engagement System Sociality and Accessibility



3

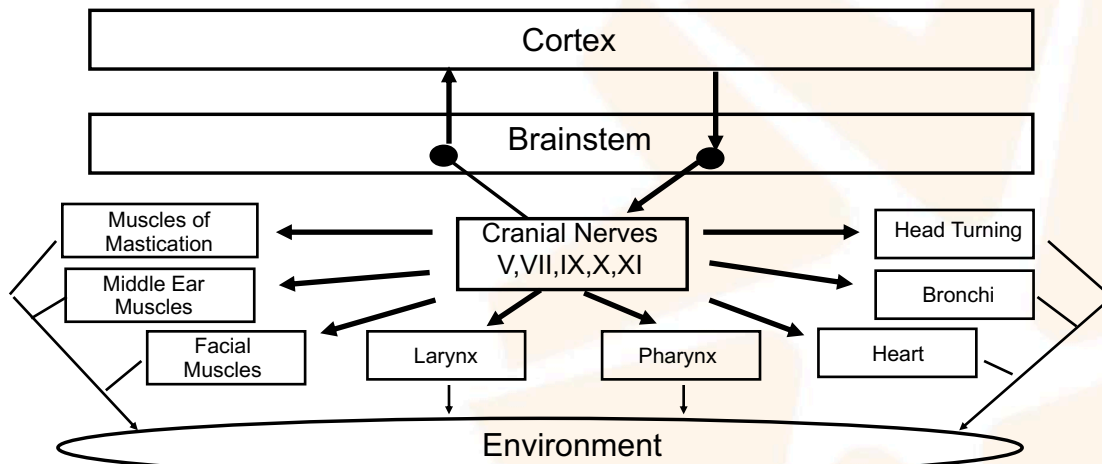
The Face-Heart Connection: The Basis of the Social Engagement System

- At birth mammals have bidirectional neural communication between the face and the heart (suck-swallow-breathe-vocalize), which forms the core of a Social Engagement System.
- Social isolation, metabolic demands, perceived danger, life threat, and illness retract the Social Engagement System resulting in a face that is not “social” and a physiological state (removal of the vagal brake on the heart) that promotes defensive behaviors.

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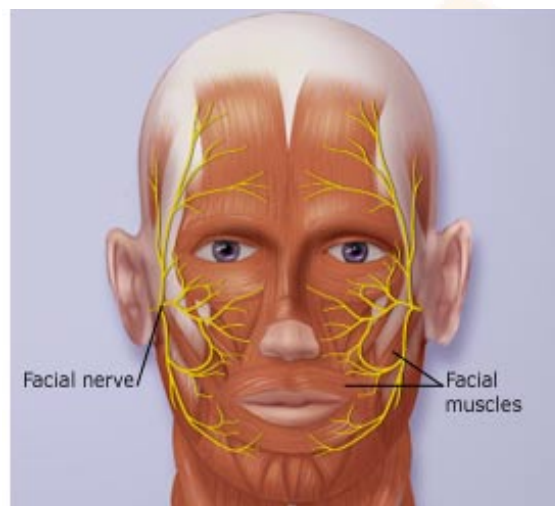
Deconstructing the Social Engagement System



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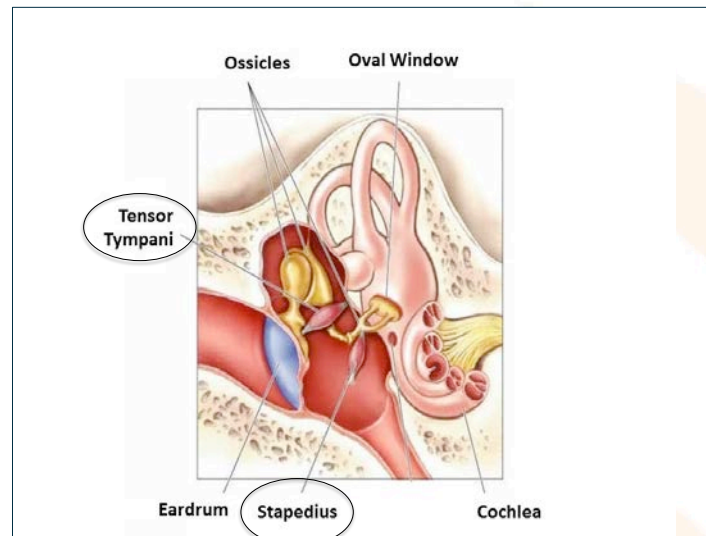
Facial Nerve (cn VII) Muscles of the Upper Face



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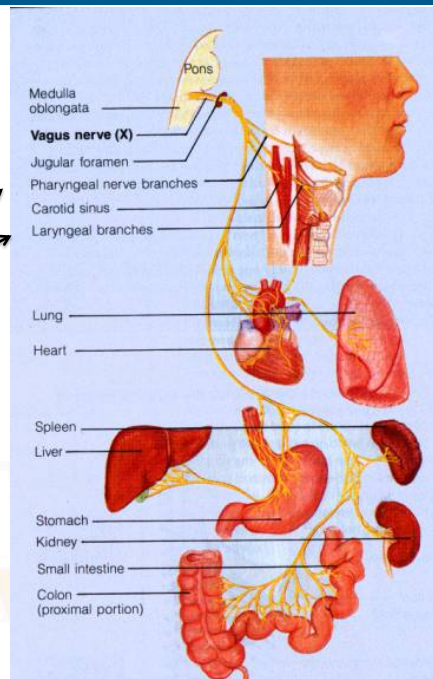
7

Muscles of the Middle Ear



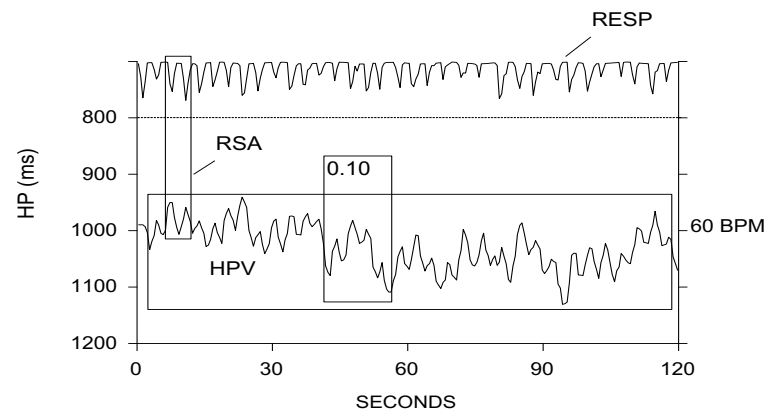
8

Vocalizations



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Respiratory Sinus Arrhythmia (RSA) An Index of Ventral Vagal Tone



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Co-Regulation A Mammalian Biological Imperative



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Co-Regulation

A Mammalian Biological Imperative



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Humans Need Others



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Relationships Regulate Physiology



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Contact and Face-to-Face Interactions



15

Contact and Face-to-Face Interactions



16

Contact and Face-to-Face Interactions



17

Autism Disruptions in Co-regulation



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Trauma Disrupts Opportunities to Co-Regulate



19

Isolation Disrupts Opportunities to Co-Regulate



20

Trauma Disrupts Opportunities to Co-Regulate



21

Trauma Disrupts Opportunities to Co-Regulate



22

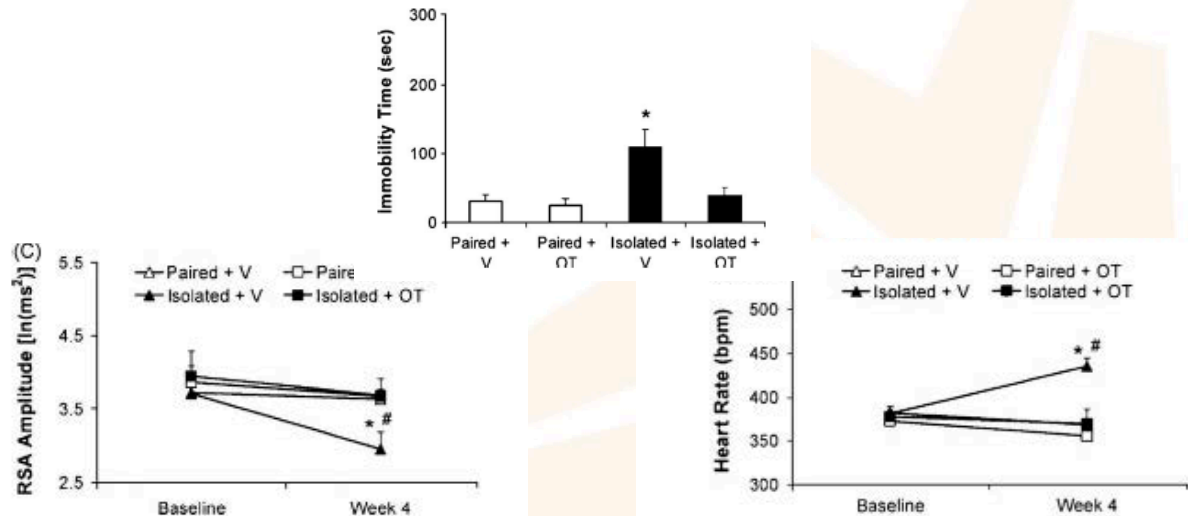
Lack of Opportunities to Co-Regulate



Survivors of Hurricane Katrina were five high in cots yesterday before evacuation from New Orleans.
Andrea D'Amico/United States Navy, via Reuters

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Oxytocin Protects Against Social Isolation



Grippe, A. J., Trahanas, D. M., Zimmerman II, R. R., Porges, S. W., & Carter, C. S. (2009). Oxytocin protects against isolation-induced autonomic dysfunction and behavioral indices of depression. *Psychoneuroendocrinology* 34, 1542-1553.

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Social Engagement System

Observable Deficits Potentially Due to Isolation

- Reduced ventral vagal tone
- Lack of prosody
- Poor eye contact and difficulties in social communication
- Blunted facial expressivity
- Difficulties in behavioral state regulation (hypervigilant, anxious, distractible, impulsive, tantrums, hypoarousal)
- Difficulties in listening, following verbal commands, speech-language delays
- Sound sensitivities
- Oral motor defensiveness (e.g., ingestive behaviors)

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The COVID-19 Pandemic is a Paradoxical Challenge to Our Nervous System

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Clinical Neuropsychiatry (2020) 17, 2, 135-138

PERSPECTIVE ARTICLE

THE COVID-19 PANDEMIC IS A PARADOXICAL CHALLENGE TO OUR NERVOUS SYSTEM: A POLYVAGAL PERSPECTIVE

Stephen W. Porges

Abstract

The spread of the SARS-CoV-2 virus presents an unprecedented event that rapidly introduced widespread life threat, economic de-stabilization, and social isolation. The human nervous system is tuned to detect safety and danger, integrating body and brain responses via the autonomic nervous system. Polyvagal Theory provides a perspective to understand the impact of the pandemic on mental and physical health. This perspective highlights the important role of the state of the autonomic nervous system in exacerbating or dampening threat reactions to the pandemic. In addition, the theory alerts us to the impact of clinical history (e.g., trauma) on autonomic regulation as an important compounding risk factor lowering the threshold to behaviorally and physiologically destabilize in response to the pandemic. The theory provides a strategy to dampen the adverse reactions to threat (e.g., acute stress disorders) through portals of social engagement that evolved to downregulate defenses to promote calmness and connectedness.

OPEN ACCESS

Citation: Porges, S. W. (2020). The COVID-19 Pandemic is a paradoxical challenge to our nervous system: a Polyvagal Perspective. *Clinical Neuropsychiatry*, 17(2), 135-138.

<https://doi.org/10.36131/CN20200220>

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The COVID-19 Pandemic is a Paradoxical Challenge to Our Nervous System: A Polyvagal Perspective

- The pandemic triggers a generalized threat reaction moving our autonomic nervous system into states of defense.
- The pandemic impacts on our biological imperative to connect.
- Public health strategies compound feelings of threat.
- Conceptualizing autonomic state as an intervening variable leads to understanding risk and optimizing treatment.
- Mitigating threat responses through neuroception using videoconferencing.

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Isolation Disrupts ANS and Sociality

- Without opportunities to 'exercise' the social engagement system the ANS shifts from states supporting mental and physical health to states supporting defense including chronic pain.
- For humans psychological or physical isolation can disrupt homeostatic processes leading to severe mental and physical illness including chronic pain.

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