

Spanda Yoga Movement Therapist Professional Yoga Therapist Training Program

Notes on the Polyvagal System

The Autonomic Nervous System (ANS) was so named because it was thought to regulate body areas that were thought to operate ‘automatically,’ meaning without volitional control, such as the heart and digestion. Cranial nerve X, also known as the Vagus nerve, was seen as a major part of the ANS, with its links to the heart, and much of the viscera both above and below the diaphragm.

The ANS was previously described as having 2 main components: 1) parasympathetic 2) sympathetic. The Polyvagal Theory posits a two part parasympathetic system.

In his groundbreaking paper of 1995, researcher Stephen Porges showed that the two branches of the Vagus nerve have fundamentally different evolutionary origins, and different roles to play. According to the Polyvagal model, the parasympathetic aspect of the ANS was really in two different parts, ventral and the dorsal. Understanding the neuroregulation of organs and of the body gives us new tools, and new possibilities for healing and for wholeness.

Porges coined the word “neuroception” to describe how mammals are constantly determining the safety of the environment. “Neuroception” is different than “perception” because the former operates at an unconscious level. The degree of perceived safety determines which part of the ANS will govern at any moment, and that will set the stage for much of our outlook (both metaphorical and literal) much of our visceral functioning, the availability and distribution of biological energy, and so on.

A 3 circuit system

The two branches of the Vagus nerve, together with the Sympathetic Nervous System comprise a 3 circuit system:

- 1) The modern, mammalian, ventral branch of the Vagus nerve is characterized by social engagement and feeling of safety. Ventral vagal is linked to muscles of the inner ear, the larynx and those of facial expression as well as viscera. It is “turned on” when a mammal is receiving cues that denote safety. These fibers are myelinated, which gives faster and more accurate transmission of information. This circuit is dominant over the other two, meaning that its activity inhibits that of the sympathetic and dorsal vagal. It is associated with full breath, and a regulated heart rhythm.
- 2) The sympathetic nervous system is understood as mobilization system. It is sometimes referred to as the flight/fright response* to what/who is perceived as dangerous, and as such, shifts the body’s resources to outward action; for instance by sending blood toward the running muscles and away from digestion. It also reduces barriers to nerve signal transmission and brings energy out of storage (raises blood sugar) The sympathetic nervous system is separate tissue from that of the Vagus nerve.
- 3) The dorsal, and evolutionary older part of the Vagus nerve is about immobilization. When the situation is understood as unresolvable, the body mechanisms shift to freeze; a sometimes effective reptilian defense, but not so for a mammal. A person in this state will have challenges speaking, swallowing and breathing effectively. It is associated with lack of sensation and perception.

To Consider:

If someone has chronic digestive issues, such as constipation, it may be linked to living in a highly sympathetic state in which the blood supply to the gut is reduced, and gut motility is reduced. Inappropriate defecation is linked to a Dorsal Vagal state, which we find in victims of crime, soldiers in battle, or first responders to disasters such as 911.

If someone has difficulty separating background noises from voices, they may be living in a dorsal vagal state because the muscles of the inner ear are not getting the ventral vagal stimulation and so are underactive. In this state, sound is transmitted through bone instead of through the ear; bone transmission is better at the low tones typically made by predators. The ear is better at hearing the pitches typical of human speech. People who have trouble sorting

out human speech from a noisy background may have low inner ear muscle tone and that may be due to low vagal stimulus.

If someone is unable to be still, she/he may be working hard to stay in sympathetic state as a defense against going into dorsal vagal shut-down state.

The lower two circuits of sympathetic nervous system dominance and of dorsal vagal dominance limit the dynamic and spatial range of movement. The greater the restriction, the less likely is access to ventral vagal states.

Since facial muscles are part of the ventral vagal system, a face that lacks expression may be due to low vagal tone.

Chronic muscular tension is typical of sympathetic engagement.

Inflammatory diseases such as arthritis are linked to low vagal tone

How to encourage a shift toward the Ventral Vagal states

Hearing prosodic voices, such as the tones considered to be mother-ese. We usually talk to our pets in this way

Eye contact with those you love and who love you, or with friends and acquaintances

Be in the arms of appropriate mammal, whether human or canine.

Lengthening exhales over inhales, such as when we sing, play a wind instrument or chant

Deliberately make “faces,” such as when telling a joke or a story, or lively conversations

Use your voice such as in chanting, singing, story telling.

Consider what you are grateful for; thus giving ourselves cues of safety

Look or listen to something you consider beautiful such as a view or artwork

Listen to music that does not have much bass, such as folk music or birdsong

Some claim that gargling, deliberately setting off a gag reflex, or brushing the neck with a scarf or soft ball will help

I wonder if deep pressure encourages it.

Specific ideas for exploration for Yoga and Yoga therapy

If you or your students have an incomplete limb extension, consider that this could be easier to find when in a ventral vagal state.

If the degree of ease in one's flexion and extension transition and range is uneven, consider that this could be easier to find in a ventral vagal state.

If flexibility is a goal, but practice isn't making a difference, consider that this could be easier to find in a ventral vagal state.

*I see the sympathetic nervous system as not just employed when there is a feeling of danger, but when one wants to change something. Just thinking about how something could be different will increase Sympathetic tone.

Fun to know: "Vagus" is from the Latin for 'wanderer,' and is so named because of its circuitous and long pathway in the body. The words vagabond and vague have the same root.