Applying the Polyvagal Theory to Equine Behaviour and the Horse-Human Relationship

The current two-branch model of the autonomic nervous system (ANS) is over 100 years old, yet continues to dominate the fields of psychology, biology, and behavioural sciences. It is also the foundational model used in equine science when teaching ethology, learning theory, behaviourism, and a neuroscience-informed perspective to behaviour shaping, enrichment, training, and health care.

Researchers began to propose changes from the 1960s onwards, including Dr. Stephen Porges, who developed the polyvagal theory (PVT) based on animal models and studies. The PVT is a second order theory that provides a useful and accessible roadmap of complicated psychophysiological terrain, in terms of understanding individual nervous systems and how they interact in relationship – providing a more nuanced lens on attachment theory and behaviour in mammals, including horses and humans.

Rather than two branches, Porges proposes that the ANS has three. The sympathetic nervous system (SNS) remains the proverbial gas pedal for mobilization. The PNS is influenced by the vagus nerve, which can further be divided into two brake systems for immobilization: the myelinated ventral vagus (innervating the parts of the body involved in social engagement, which acts like a pacemaker on the heart allowing mammals to slow down and feel safety in connection), and the non-myelinated dorsal vagus (innervating sub-diaphragmatic organs that support rest and digest under conditions of safety, shifting to conservation, shutdown, gastrointestinal and other issues under situations of threat).

This means that rather than a simple, linear reciprocal system (when the SNS is on, the PNS is off, and vice versa), the ANS is understood to be a complex, dynamical system where the three branches can be functioning to varying degrees at the same time, fluctuating in response to the neuroception of safety, danger, or life threat. Using this model, tracking and adapting antecedents, behaviours, and consequences becomes more nuanced when observing the intricate interplay between sustainable physiology, survival physiology, and conservation physiology.

The PVT has numerous practical implications and applications for the horse-human relationship, including equine behaviour consulting, training, riding instruction, horsemanship, equestrian disciplines and sports, equine health and medical sciences, equine-assisted therapy, and therapeutic/adaptive riding. Understanding the link between adversity, neural templates, the hierarchical defense cascade, co-regulation and co-dysregulation (entrainment), attachment, behaviour patterns, health conditions, and relational concerns becomes all the more refined when using this three-branch model as a lens.

(Poster will include professional illustrations and citations.)

Layperson's message:

The polyvagal theory (PVT), developed by Dr. Stephen Porges, offers a practical framework for understanding problematic equine behaviour, body language, and horse-human relationship challenges. In spite of its unusual name, the PVT simplifies complicated neuroscience so that we can recognize the conditions and factors that lead to difficulties, and identify changes that can help both our horses and ourselves shift from being in survival mode to feeling safety with one another. When our bodies and our brains feel safe, we have more capacity for connection, trust, effective communication, learning, productivity, and performance.