



Drumming, Rhythm, and Regulation Through a Polyvagal Lens



In 1995 Stephen Porges described a new theory that sought to explain the relationship between the Autonomic Nervous System (ANS) and elements of human behaviour. The ANS is part of the peripheral nervous system (PNS); nerves that extend from the central nervous system (CNS) throughout the body and obtain information through the senses about changes in the environment. The ANS is responsible for regulating many of the body's core homeostatic functions, such as heart and breath rate and digestion – automatic, non-conscious activity essential to survival.

Porges described how the autonomic nervous system can be activated in multiple ways in relation to stress and how these impact human behaviour, and that each of these responses is linked to an evolutionary time-line. These biological processes originated between 200 million to 500 million years ago and are generally non-adaptive to levels of modern-day stress that is often unrelenting.

This neuroceptive physiology is also not able to be impacted directly through traditional 'talk-based' therapies, the dominant model for psychological support in modern times. Significantly non-verbal, expressive therapies using rhythm, movement, entrainment and a focus on sensory integration are more often able to engage the senses and restore equilibrium (Malchiodi, 2020). Traumatic events, that activate these neural responses not only shut down the reasoning and language areas of the brain but also lead to a sensory defensiveness and a shutdown of sensory awareness that fractures an individual's sense of self and can lead to dysfunctional coping mechanisms and a lack of physical security with one's body (Levine, 2008). Expressive therapies incorporating rhythm have been central to healing strategies for loss and grief in Indigenous communities for thousands of years and provide an ongoing resource for therapists wishing to restore health by engaging the senses.

One key practice used to develop a connection between our feelings and our thinking is the use of bilateral stimulation to activate and integrate information across the whole brain. Using both hands to play rhythmic patterns on the drum, particularly when these cross the mid-line, is thought to stimulate both sides of the brain, connecting both implicit and explicit memory. Florence Cane, a pioneer of the 'Arts Therapy' movement back in the 1950's worked extensively with children using bilateral rhythmic movement and noted the self-soothing regulatory impact these exercises had (Cane, 1951). Importantly, like many other musical exercises these can be enhanced through collaborative play between the client and therapist or between members of a group program – co-regulation being a critical component of regulation generally.

Practical examples of bilateral stimulation exercises on the drum generally begin with participants starting slowly making rhythmic patterns in the air with both arms & hands – common patterns include gentle wave shapes, figures of eight, and the growing tree - where we start off narrow at the base (trunk) and expand above our heads to incorporate all the branches (crown). Circular

rotations of the wrist and arm are also useful. At regular points within the rhythm the hands will meet on the drum surface, often supported by a count from the therapist to coordinate timing. Connecting cycles of breathing to the rhythm can add to the benefit of the exercise, engaging and strengthening the vagal nerve which in turn helps activate the parasympathetic nervous system (PNS) to calm and regulate (Gerritson & Band, 2018). Playing the drum adds a tactile quality to the exercise and an additional level of sensory awareness, as well as increasing the level of fun and joy associated with such body-based exercises and simultaneously reducing self-consciousness.

These exercises draw upon many of the same hypothesis as those underlying the theory behind Eye Movement Desensitization and Reprocessing therapy (EMDR) developed by Shapiro (1989) and tapping exercises used widely in trauma desensitisation, with research showing the such bilateral movements both serve to reduce emotional distress and the vividness of emotional memory (Barrowcliff et al, 2004; Kavannagh et al, 2001). These dual attention exercises are thought to elicit a natural response of attention that helps reorientate a traumatic experience, interrupting previous associations between memory and negative emotions and initiating a relaxed response connected to a new awareness of safety (Stickgold, 2002).

In Polyvagal theory (Porges, Doussard-Roosevelt, & Maita 1994) the key neural pathway to calm and safety is through the ventral vagal system which is readily activated through sound and rhythm. The vagus nerve is one of the key components of the PNS and oversees many core bodily functions including mood, immune response, heart-rate and digestion. It is central to communication between the brain and the gastrointestinal tract (brain-gut axis) and also fundamental in driving social connection through its impact on trust and empathy (Breit et al, 2018). Many indigenous rituals employ drumming to stimulate the vagal brake and help us connect positively to others, and as such many drumming exercises serve as functional processes for ventral vagal development and activating our social engagement system. Almost all studies of group drumming point to improvements in social connection and mood (Faulkner, 2021).

Adding vocalisation to drumming exercises is another method used to increase vagal tone and conveying a physiological state of calm. In particular, vocals that extend the outward breath are most useful – adding sighs, aaaahhh's, oooohhh's over the top or in-between a universal heartbeat rhythm is commonly used to this effect. Helping clients find words that are soothing and allowing improvisation over the top of drumming rhythms is another method. In similar ways that we learn to understand how the prosody of the voice (intonation, stress & rhythm), impacts our sense of safety and calm, we can use this knowledge to regulate ourselves and others in our drumming. As counsellors we use these techniques every day to help create a safe space for our clients. In drumming, certain tones, rhythms and accents impact our level of neuroception – our automatic sense

of safety or threat. Regular, slowly paced, soft rhythms elicit feelings of safety, whilst irregular, fast-paced, sharp and loud rhythms give rise to fear and anxiety.

Sensory defensiveness is a common reaction to traumatic experiences, where we close down access to our internal states, Interoception, as a way of managing our emotional pain. Words often fall short of describing these feelings and it is common that people struggle to identify and name them. The drum is a safe vehicle to help people locate, identify and express feelings held in the body that are contributing to their suffering at both a psychological and physiological level. Music is a language of emotion and perhaps our most immediate tool for safe access. The drum itself can act as a safe container in which to release our feelings and different rhythms and tones can express feelings in a cathartic process that doesn't suffer from the judgements and narrow definitions associated with language. Expressive, cathartic exercises for feelings on the drum can include 'Check-ins' – "Play how you've been feeling since I last saw you"; Narratives – "Play how you felt during that experience"; Shared journeying – "If you are comfortable, play through that experience, no right or wrong, and I will join you (mirroring) on your journey". Mirroring exercises that examine emotion are particularly powerful for clinical insight into how people are feeling.

Embodied cognition is another theoretical framework closely aligned to Polyvagal theory and an awareness of how the senses impact behaviour on a subconscious level, and posits that our cognitive processes are also greatly influenced by our physical interactions with the world around us, with sensory signals impacting both positive and negative healing experiences (Colloca & Howick, 2018). Our experiences are embodied and relational, and the body plays a central role in shaping our understanding of the world. In particular, memories of past events that shape our perceptions are likely to involve stored sensorimotor experiences. Cognition is grounded in perception and action with even the most abstract thoughts being sense-based. This highlights the essential role of experiential practices in learning and healing. Knowledge acquisition is richer and embedded deeper with the use of modalities that incorporate the senses through active participation (Keifer, Hoffmann & Arndt, 2022).

Drumming uses two of the key senses central to learning and focus – touch and movement. Tactile experiences, such as drumming, when combined with movement stimulate higher order cognition (Hrach, 2021). The coordinated movements in drumming support physical coordination balance and grounding, but even more importantly develop an interpersonal synchronicity and cohesion. Drumming with others, even when we play very simple rhythms, promotes a level of social connection and social harmony mirrored by the music. Not only are our hands working in time together but at the same time our heartbeats are entraining and our breathing patterns align. How we perceive the motor acts and emotive reactions of others are facilitated through the mirror mechanism of the brain when we participate in these types of collaborative activities and are central to rebuilding

empathy and understanding between people who may have experienced broken or distorted attachment patterns (Gallagher, 2011).

Through a polyvagal lens we seek to move clients away from sympathetic activation arousal and dorsal vagal collapse towards ventral vagal activation and connection through the social engagement system of the PNS. This shift towards the neuroception of safety and calm is facilitated by a range of body-based techniques that cultivate a non-judgemental awareness of our bodily feelings and sensations, with an orientation of curiosity and acceptance. Body-awareness is an inseparable aspect of self-awareness in the context of our ongoing interactions with the world around us. Rhythmic exercises on the drum are somatic in nature and offer clinicians multiple ways of engaging and strengthening the vagal brake, regulating the defensive mechanisms of the ANS and enhancing positive social engagement, in a safe and uplifting way.

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