Drumming, rhythm and regulation through a polyvagal lens

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Abstract

This article examines links between polyvagal theory and the use of rhythmic music, particularly drumming and percussion, and voice in assisting clients to manage and appropriately respond to their emotional experiences. Emotional regulation is recognised as a core focus within trauma treatment and a common challenge for many people managing the impacts of trauma or disruptions to early attachment. Polyvagal theory is one of the leading theoretical frameworks for clinicians working to assist people to manage feelings that often overwhelm them and that make daily functioning difficult. Although several of the leading researchers into trauma recovery advocate the use of somatic therapies using rhythmic techniques, including drumming, to support emotional regulation, there is very little practical guidance for practitioners wishing to incorporate this modality into their work. This article provides practical insights into how exercises on the drum align with polyvagal theory and can support clients managing dysregulated stress responses and assist with emotional control, the processing of traumatic memories and the re-establishment of healthy social relationships.

Keywords

Rhythm, regulation, polyvagal theory, expressive therapy, somatic therapy, drumming, trauma

Introduction

For thousands of years there has been a line of knowledge linking the use of rhythmic music, song and dance to healing (Kenny, 2006), passed down through indigenous cultures across the world and more recently finding a place within contemporary therapeutic approaches, supported by an increasing body of evidence (Faulkner, 2021). For the past thirty years, my work as a counsellor and researcher in Australia has been part of that integration between an ancient understanding and Western scientific validation, which has seen a rise in the use and acceptance of these types of expressive therapies in modern-day practice.

Working early on in my career in Australian Indigenous communities, I became acutely aware of the limitations of my therapeutic training, which was entirely focused on cognitive therapies, and relied heavily on the use of language as a medium for client engagement and behavioural change. Without a common language and with high levels of trauma impacting trust and engagement with individuals in these communities, I was in desperate need of a new

medium, and hesitantly turned to drums and music after witnessing the joy they evoked in local community gatherings. What started hesitantly, quickly turned to conviction as I witnessed the joy, connection, fun and sense of safety that emanated from my individual, family and group sessions, and that led to positive changes in people's lives. These positive outcomes are consistent with findings from a diverse range of studies on drumming in therapeutic contexts (Faulkner, 2021).

This article explores the use of rhythmic music, particularly drumming and percussion, with reference to my own clinical experience and the growing focus in trauma therapies of interventions that connect an individual's psychological state to their neurophysiological health; interventions that are increasingly connected to the emergence of polyvagal theory in the 1990s. It begins with a look at some of the theoretical frameworks that have led the movement towards incorporating an understanding of the body, our nervous system and our physiology generally in relation to psychological states and behaviours, with a strong focus on polyvagal theory. It then links the different elements of rhythmic music interventions to this new understanding, while concurrently offering the practitioner practical examples of exercises they may incorporate into their practice.

Embodied cognition

Embodied cognition is a theoretical framework examining how the senses impact behaviour on a subconscious level. Its central hypothesis is that an individual's cognitive processes are also greatly influenced by their physical interactions with the world around them, with sensory signals impacting both positive and negative healing experiences (Shapiro, 2019). 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 (Kiefer et al., 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 is facilitated through the mirror mechanism of the brain when we participate in these types of collaborative activities and is central to rebuilding empathy and understanding between people who may have experienced broken or distorted attachment patterns (Gallagher, 2011). Studies have shown that these types of synchronised musical experiences increase both resilience and mental well-being (Juslin, 2019), and that matching rhythmic behaviours, specifically, are associated with the social inclusiveness central to psychological health (Cohen & Wills, 1985).

Polyvagal theory

In 1995, Stephen Porges described a new theory that linked the principles of embodied cognition to the workings of the autonomic nervous system (ANS) and elements of human behaviour, in particular our ability to socially engage with others within a context of trust and safety or have this undermined by factors that invoked responses of fear and threat (Porges, 2018). 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 our environment. Within the ANS there are two main branches – the sympathetic nervous system (SNS) responsible for mobilisation in response to threat and the parasympathetic nervous system (PSNS) that controls homeostasis and the body at rest. Both are needed for psychological balance.

The ANS, and in particular the PSNS, is responsible for regulating many of the body's core homeostatic functions, such as heart and breath rates and digestion – automatic, non-conscious activity essential to survival. Porges (1995) describes how the autonomic nervous system can be activated in multiple ways in relation to threat and how this impacts human behaviour, and that each of these responses is linked to an evolutionary timeline. These biological processes developed as survival imperatives and originated between 200 million and 500 million years ago. As short-term responses they are often effective safety mechanisms but when activated for extended periods can become counter-productive and lead to acute disconnectedness (Porges, 2018).

This neuroceptive physiology is not able to be impacted directly through traditional 'talk-based' therapies, the dominant model for psychological support in current 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 activate the sympathetic nervous system and dorsal vagus nerve as a defence reaction that leads to behavioural responses of fight, flight or immobilisation. These same neurological changes lead to the reasoning and language areas of the brain being shut down as well as a sensory defensiveness and a loss of sensory awareness that fractures an individual's sense of self and can lead to dysfunctional coping mechanisms and a lack of physical security within one's body (Levine, 2008).

Central to polyvagal theory is an individual's sense of safety. Our autonomic nervous system is constantly alert to danger, evaluating risk and sending messages in response to sensory inputs that lead to behavioural change based on that assessment. The regulation of our physiology and the connected emotional and behavioural responses are embedded in our relationships. Activation of the PSNS has a calming effect that stems directly from sensory input from the face and voice and a reciprocal synchronicity in these signals between individuals. These connections stimulate the myelinated vagus nerve to regulate our physiology, lowering heart rate, blood pressure and other bodily functions associated with calm (Porges, 2018). These actions, known as the 'vagal brake' reduce the impact of the mobilisation of the SNS in times of stress and and dampen hypothalamic–pituitary–adrenal (HPA) axis activity (Egizio et al., 2008). For people living with acute stress strengthening of the vagal brake is a central part of restoring homeostasis.

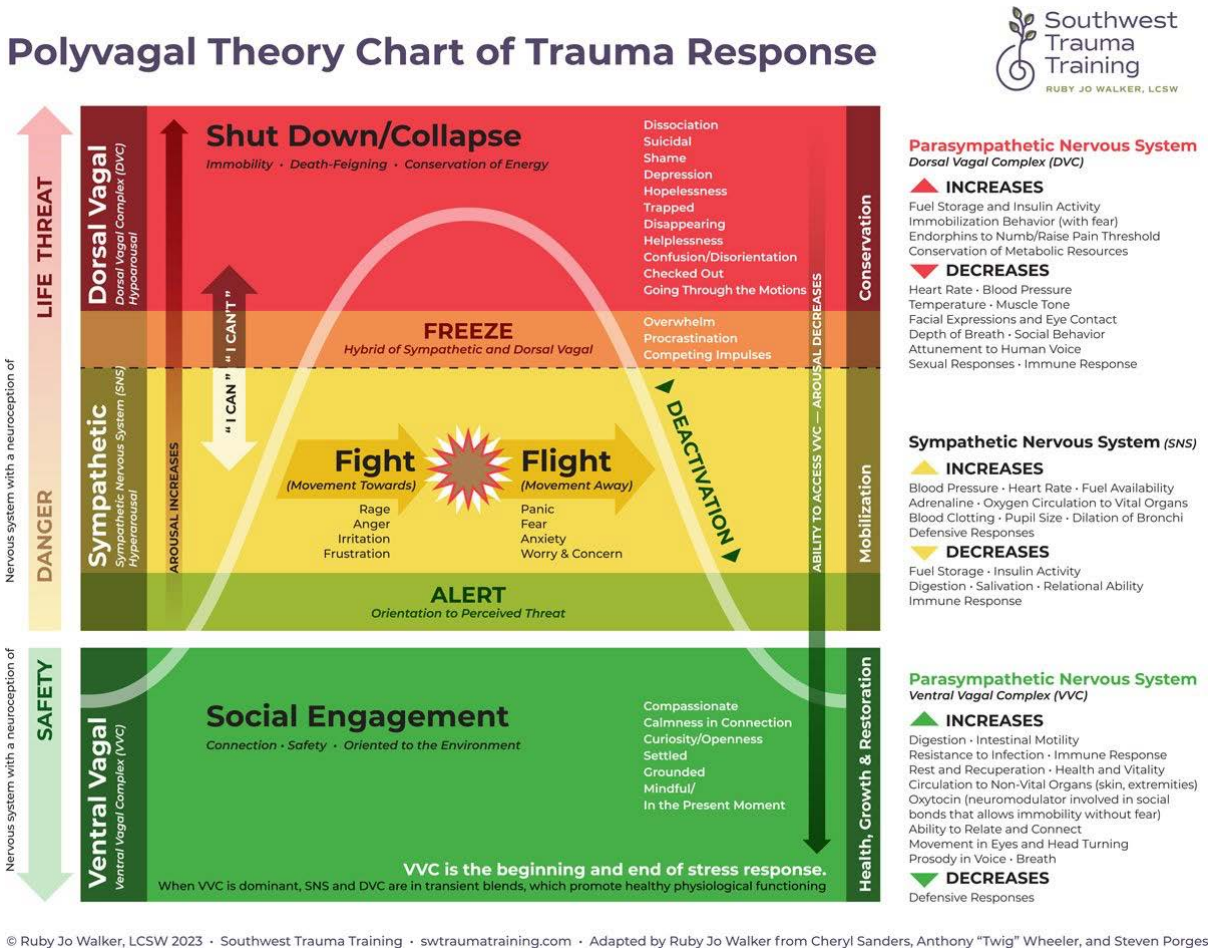

Figure 1. Polyvagal Theory Chart of Trauma Response. Reproduced with permission from Ruby Jo Walker. https://www.swtraumatraining.com/

Co-regulation is at the heart of connection between people as they engage together and connect in a safe way and find synchronicity between their physiological and behavioural states. Co-regulation is an essential element of well-being, and one that is often highly challenging for people impacted by trauma or anxious–ambivalent, disorganised or avoidant attachment (Dana, 2018). This inability to trust and connect may be addressed safely within group music-making, allowing people to experience a range of visceral feelings as they play music together within a safe framework. Research has shown that group music-making releases neural peptides, including oxytocin, that play an important role in forging trust between people (Chanda & Levitin, 2013).

For people who have experienced trauma, or other experiences that impact their ability to connect positively to others, a heightened awareness of threat is ever present. This faulty 'neuroception', our subconscious monitoring for threat, promotes defensive strategies that can activate the SNS and lead to mobilisation (fight or flight) or, in extreme circumstances, lead to the collapse of the dorsal vagus nerve, our oldest evolutionary response, resulting in immobilisation or dissociation.

Expressive therapies incorporating rhythmic music have been central to healing strategies for loss and grief in indigenous communities for thousands of years. They provide an ongoing resource for therapists wishing to restore health by engaging the senses and supporting positive neurophysiological states that replace fear with safety and allow the emergence of positive social behaviours. The uplifting nature of communal music, playing in time together,

incorporates a process of attunement and co-regulation, integrating the different states of the ANS so that the defensive mechanisms are neutralised (Porges & Rossetti, 2018).

Bilateral stimulation, regulation and co-regulation

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, (Talwar, 2007). 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 in the 1950s, worked extensively with children using bilateral rhythmic movement and noted the self-soothing regulatory impact of these exercises (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 by making rhythmic patterns in the air with both arms and 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 PSNS to calm and regulate (Gerritsen & 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.

Figure 2. Bilateral movement on the drum, 2022. Photo: Simon Faulkner (consent was granted by those appearing in these photos).

These exercises draw upon many of the same hypotheses as those underlying the theory behind eye movement desensitisation and reprocessing therapy (EMDR) developed by Shapiro (1989) and tapping exercises used widely in trauma desensitisation, with research

showing that such bilateral movements reduce emotional distress and the vividness of emotional memory (Barrowcliff et al., 2004; Kavanagh 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).

Drumming and polyvagal theory

In polyvagal theory (Porges et al., 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 time-honoured method used to improve vagal tone and a physiological state of calm. In Porges' theory, purposeful control of the breath can be used to impact both the laryngeal and pharyngeal nerves to initiate a relaxation response (Porges, 2017). In particular, vocals that extend the outward breath are most useful – adding sighs, aaaahhhs and oooohhhs 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. Research into the benefits of traditional chanting practices that focus on similar outward breathing patterns and vocal sounds have shown a range of positive outcomes including stress reduction, improvements in mood, and reductions in symptoms associated with post-traumatic stress disorder and depression (Lynch et al., 2018).

In the same way that we learn to understand how the prosody of the voice (intonation, stress and rhythm) impacts our sense of safety and calm, so too can we learn to regulate ourselves and others in our drumming. As therapists 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, slow-paced, soft rhythms elicit feelings of safety, whilst irregular, fast-paced, sharp and loud rhythms give rise to fear and anxiety. By shifting between different tones and tempos, group drumming can provide individuals sensitive to visceral feelings of threat with a resolution to the discomfort of changing emotional experiences.

Sensory defensiveness is a common reaction to traumatic experiences, where we close down access to our internal states – also known as '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. In my own work the drum has been 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 through which to safely access and express these sensations. 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 may avoid some of 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”; and 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.

Fun

One of the key elements of rhythm-based, musical experiences is the fun experienced through collaborative play. When we offer clients the opportunity to play music together in a safe and non-competitive environment, we promote neural exercise based on co-regulation. Few music forms offer the almost instantaneous rewards of rhythmic percussive music, which requires no prior experience and which, for both therapists and their clients, opens access to the many positive outcomes participatory music-making has to offer. The strategies promoted within polyvagal theory for supporting connection and safety with another individual, as the basis for healthy psycho-social development, run parallel to the benefits of musical play. There is reciprocity, two-way interaction and bonding; there is movement and the shared experience; and there are the vital social interactions that develop co-regulation through face-to-face connection, vocal prosody and touch. Play is often denigrated in relation to developmental outcomes in therapy and education, but evidence points to it being at the very heart of exercising the social engagement-system central to optimal psycho-social development within polyvagal theory (Porges, 2015). Similarly, music is often seen as complementary or trivial in relation to other therapeutic and education mediums despite an overwhelming body of evidence that reveals its positive impact across a wide range of developmental areas (Hallam, 2010).

Summary

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 PSNS. This shift towards the neuroception of safety and calm may be facilitated by a wide range of techniques using the drum. These exercises have their basis in a line of knowledge that extends through almost every indigenous society on earth, across thousands of years – an evidence base beyond comparison. Linking this long history to current trends and understandings in therapeutic practice, polyvagal theory alerts us to the myriad of connections between the somatic nature of drumming and the biological determinants of health, as well as the central role of connection and belonging in restoring equilibrium and social healing. Drumming offers clinicians multiple ways of engaging and strengthening the vagal brake, regulating the defensive mechanisms of the SNS and enhancing positive social engagement, in a safe, fun and uplifting way.

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Published: April 2023

Issue: Vol.18, No.1

Word count: 2,924

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Cite this practice paper
Faulkner, S.C. (2023). Drumming, rhythm, and regulation through a polyvagal lens. *JoCAT, 18*(1). https://www.jocat-online.org/pp-23-faulkner