

Research from the field of neuroscience has solidified our understanding of the way rhythmic music can support emotional regulation. Researchers have demonstrated a clear link between the auditory system and motor systems of the brain detailing how neurons in the ear, responding to the rhythm and tempo of music, work in synchronicity with those areas of the brain that regulate our response to stress (Thaut, McIntosh & Hoemberg, 2015). In particular this reciprocal relationship extends to the motor function of the basal ganglia, a primal region of the brain involved in decision-making, motivation, and emotional processing, often associated with reward and risk evaluation and the associated involuntary responses. Dysfunction in this system can lead to poor emotional control (Hilbert et al, 2015).

This has specific implications for addressing neurological changes brought on by exposure to severe stress, recognising that shifts in the stress-response can be mediated by targeted interventions that provide rhythmic, repetitive activation of those impacted neural networks. The Rhythmic musical play and specifically targeted exercises within the Rhythm2Recovery model utilises these principles to support regulation, and extends this into the social/relational dynamic of group musical connection that strengthens the child's relational neurobiology, assisting with trauma recovery and acting as a protective factor against future social & emotional challenges.

Auditory cues also influence the autonomic nervous system (ANS), a network that controls other involuntary processes like breathing and heart rate. The autonomic nervous system is constantly alert to danger, evaluating risk and sending messages in response to sensory inputs. Communal music making, playing in time together, incorporates a process of attunement, entrainment and co-regulation, integrating the different states of the ANS so that these defensive mechanisms are neutralised, and senses of safety and security are restored through engagement of the parasympathetic nervous system (Porges & Rossetti, 2018).

When people participate in group music-making they can also exercise a range of conscious strategies to help regulate their emotions, including 'suppressing' unwanted thoughts and feelings, and 'detaching' themselves from these same emotional intrusions. They may 'distract' themselves or use the 'cathartic' nature of drumming to release pent-up emotion. They may learn to 'tolerate' and 'accept' these challenging feelings as they arise through the music – coming to terms with them. Or find they are able to gain new perspective and see their emotional responses in a new light; 'reappraising' and 'problem solving' (Fancourt, 2026).

### References

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