

# The Importance of Innate Rhythmic Movements

By Sonia Story, developer of the [Brain and Sensory Foundations curriculum](#)

When we observe nature, rhythm appears to be a fundamental property of life. Healthy human beings are rhythmic by nature: our breathing is rhythmic; our hearts beat rhythmically; we chew rhythmically; our bodies function on circadian rhythms.

Rhythm is strongly featured in human development. A healthy baby in the womb hears his mother's rhythmic heartbeat, feels his mother's rhythmic walking. A baby sucks rhythmically for comfort and nourishment. Many innate infant movements are rhythmical — these are natural, spontaneous movements that all healthy babies do when given the opportunity. Stimulation from these innate rhythmic movements in the first year of life is fundamental for development and drives the growth of the brain, body, and sensory systems.

When I first learned about these natural infant rhythmic movements, I could directly experience their relaxing effects, but I did not fully grasp the transformative power they held. It is easy to observe the innate rhythmic movements and think: "They look too simple to do anything." I underestimated their value — but not for long, because I had an outpouring of very positive, consistent feedback from children, parents, and professionals who were using these movements on a regular basis.

I thank my two main teachers in innate rhythmic movements: Harald Blomberg, MD, and Moira Dempsey; and I am grateful for all of the children, parents, and professionals who have shared their experiences with me. Here is my understanding (paraphrased from the lectures of Dr. Blomberg) about why these movements work and why they are critically important to our development and continued wellbeing.

**The innate rhythmic movements are calming and help to mature the brainstem, cerebellum, basal ganglia, and sensory functions.**

**Brainstem** — When the brainstem is matured via the action of the innate rhythmic movements, it can do its jobs such as moderate muscle tone, filter and relay sensory information to the brain's cortex, and develop and integrate primitive reflexes.

In turn, sensory information helps the brain develop pathways from the brainstem up to the cortex. This allows us to access higher-level executive functions such as focus, impulse control, emotional regulation, communication, and learning.

**Cerebellum** — When the cerebellum is matured via the action of the innate rhythmic movements, pathways develop from cerebellum to cortex allowing for the same higher-level executive functions to develop. Also, from the mature cerebellum, direct pathways link to the speech centers and eye movement centers of the cortex. A mature cerebellum is greatly involved in learning and reading.

**Basal ganglia** — When the basal ganglia is matured via the action of the innate rhythmic movements, it allows for smooth, effective voluntary movements, maturity of postural systems, and the ability to be still and focused.

**Sensory Systems** — Innate rhythmic movements at the beginning of life are especially helpful for developing the vestibular, proprioceptive, and tactile senses. As these sensory systems gain maturity, other sensory systems are also developing — of these, vision and hearing are of the utmost importance to communication and learning.

When the brainstem, cerebellum, basal ganglia, and sensory systems are mature, this allows for proper balance, postural control, strength, stamina, and coordination. Together, maturity in these systems gives us access to focus, learning, emotional-social skills, and other executive functioning skills.

*continued*

"Rhythmic stimulation has the potential to be a powerful intervention. The broader one's investigation into neurobiology, the more the arguments for this view accumulate."



*Neural connectivity, music, and movement: a response to Pat Amos Barnhill, E.; Front Integr Neurosci. 2013; 7: 29. [Paraphrased]*

Equally important is that these innate rhythmic movements seem to greatly improve sleep. One of the most common experiences individuals report is better quality of sleep after doing these movements.

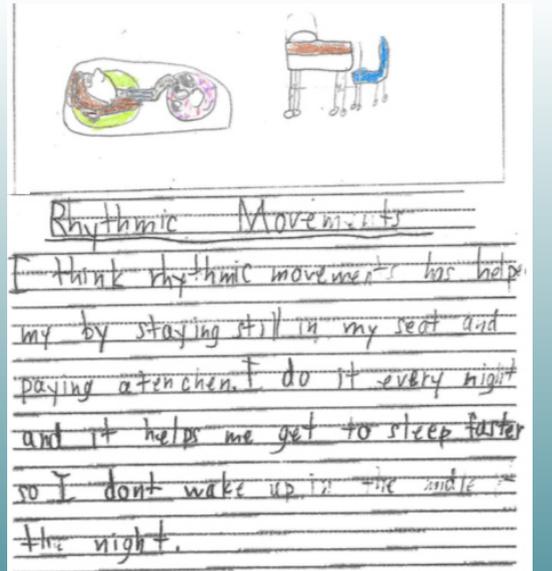
In early development, rhythmic movements work in concert with primitive and postural [reflex movements](#) to establish the foundation for function. **It is useful to know that innate rhythmic movements are an ideal foundation for reflex integration.** For highly sensitive

individuals, starting with reflex stimulation — without doing innate rhythmic movements first — can be uncomfortable and dysregulating.

For most individuals the innate rhythmic movements are calming, enjoyable, nurturing, and conducive to bonding. They help bring us to our parasympathetic nervous system state. Doing the innate rhythmic movements first provides calm and maturity to the sensory systems, which then allows us to receive reflex stimulation and integration more readily. For most individuals, developing a foundation of innate rhythmic movement allows for deeper, more stable reflex integration.

“I think rhythmic movements has helped me by staying still in my seat and paying atenchen [sic]. I do it every night and it helps me get to sleep faster so I don't wake up in the middle of the night.”

— Erin, 2nd-grade student of Anne Nguyen Pham



**Harald Blomberg, M.D. used a combination of innate rhythmic movements and integration of primitive and postural infant reflexes to help children and adults overcome learning, emotional, and mental health challenges** (Blomberg, H.; Dempsey, M., 2011). There is preliminary evidence showing that children with challenges respond well to Blomberg's and Dempsey's combination of innate rhythmic movements and reflex integration movements (Grigg, T. M.; Fox-Turnbull, W.; & Culpan, I.; 2018 and Gazca, M., 2012).

For supporting research and rationale for the use of rhythmic movements to enhance functioning, see the discussion and references below. ■

## Evidence Basis and References

Research has shown that even newborn infants can recognize and respond to rhythm. (Winkler, I.; Háden, G.P.; Ladinig, O.; Sziller, I.; Honing, H., 2009). Parents intuitively soothe their babies with rhythmic rocking and gentle rhythmic patting. Innate rhythmic movements of very early infancy are associated with the development of language (Iverson, J.M., 2010) and a child with atypical rhythm is likely at risk for developmental speech and language disorders (Ladányi E.; Persici V.; Fiveash A.; Tillmann B.; Gordon R.L., 2020).

In later stages of development, healthy babies crawl rhythmically on the belly and on hands-and-knees. Rhythmic crawling may make a difference in our ability to learn well. For example, crawling in 9 month-old infants is associated with more flexible memory retrieval (Herbert, J.; Gross, J.; Hayne, H., 2007). In her book, *Reflexes, Learning and Behavior*, Sally Goddard notes the importance of infant belly crawling and hands-and-knees crawling in the development of visual skills, and she cites research observing that a high percentage of children with reading difficulties skipped the crawling stages in infancy.

When infants engage in rhythmic movements, they smile more (Zentner, M.; Eerola, T., 2010) which suggests that rhythmic

movements help develop positive emotional states. Another emotional benefit of rhythmic input is discussed by Bruce Perry, M.D. Perry has found that patterned, repetitive rhythmic stimulation is highly effective for trauma recovery because of its regulatory effect on the brainstem (Perry, B., 2006).

A body of research points to the importance of attaining competence in the perception and production of rhythm and rhythmic movement. This is because the lack of rhythmic ability, or rhythmic impairment, is associated with dyslexia, developmental coordination disorders, and ADHD symptoms (Ladányi E.; Persici V.; Fiveash A.; Tillmann B.; Gordon R.L., 2020).

If rhythmic impairment is associated with learning and motor challenges, then it makes sense to apply rhythmic movements to see if they can help mitigate these challenges. Research suggests that rhythmic input is beneficial for learning challenges (Grigg, T. M.; Fox-Turnbull, W.; Culpan, I., 2018). For example, rhythmic movement facilitates auditory perception (Lakatos, P.; Gross, J.; Thut, G., 2019). Enhanced auditory perception could, in turn, enhance learning. Like learning

challenges, motor deficits, such as those seen in stroke patients, also improve with rhythmic input. (Hong, H.-J.; Kim, Y.-M., 2016 and Suh, J.; Han, S.-J.; Jeon, S.; Kim, H.-J.; Lee, J.; Yoon, T.; Chong, H.-J., 2013). In another example, researchers demonstrated improvements in functional performance for Parkinson's patients using rhythmic auditory input (Kadivar, Z.; Corcos, D. M.; Foto, J.; Hondzinski, J. M., 2011).

Sensory-motor disorders also constitute a defining characteristic of autism (Torres, E.B.; Whyatt, C.; 2018). Research points to rhythmic input as a possible beneficial intervention for individuals with symptoms of autism. (Amos, P., 2013; Hardy, M.W.; Lagasse, A.B., 2013). Eric Barnhill postulates that rhythmical movement done to music could aid an individual

with autism by increasing the functional connectivity in the brain (Barnhill, E., 2013).

In neurorehabilitation, clinicians are advised to use rhythmic movements for calming and to improve hypotonia (Farber, S., 1982). Blomberg successfully used innate rhythmic movements for helping to reduce spasticity in individuals with cerebral palsy (Blomberg, H., 2009).

In addition to their calming, maturing, and organizing effects in development, many of these innate rhythmic movements involve weight shifts that are likely important in developing proper upright posture, balance, and gait. While simple in nature, the innate rhythmic movements may offer profound and wide-ranging benefits for individuals of all ages. ■

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