Transforming Attention and Behavior Issues
with Primitive Reflex Integration

Presented by Sonia Story, M.S. for the Inclusive Classrooms Summit, 2026

What is a Primitive Reflex?

Primitive reflexes are innate, automatic, stereotypical infant movements in response to a specific sensory stimulus. They are expressed naturally in healthy infants.

Essential for survival, protection, and for building the brain, body, and sensory systems. Over time, they should gradually become dormant as the braim matures.

When retained past the first year of infancy, active primitive reflexes are associated with deficits in physical, sensory, social, emotional, and cognitive function.

What Are Neurodevelopmental Movements?

Innate movements, active in utero and early infancy. Build the brain, body, and sensory systems—primitive & postural reflexes, innate rhythmic movements, and others

These are REQUIRED, not optional

- Roll, crawl, stand, walk, and run
- Develop sensory processing, brain maturity
- Ability to speak and learn with ease
- Develop emotional and cognitive skills
- Have upright posture, strength, and stamina

Which babies are lacking in neurodevelopmental movements?

*Photos from Kathleen Porter, author of *Healthy Posture for Babies and Children* www.kathleenporter.com

- Breathing
- Posture
- Core strength
- Balance
- Muscle development
- Sensory development
- Focus
- Speech
- Social-emotional skills
- Learning

All depend on infant movements

Motor deficits can be carried from infancy into childhood

Without intervention, most children do not grow out of neurodevelopmental deficits
(Adamović, 2022; Salavati, 2021; Grzywniak, 2016)

Photos from Kathleen Porter, author of *Healthy Posture for Babies and Children* kathleenporter.com

Soft Neurological Signs

Glitches in the CNS, sensory, and motor systems

- The presence of primitive reflexes past the first year of life is considered abnormal and is a soft neurological sign (Behrman et al., 2000).
- "The finding of two or more persistent soft signs correlates significantly with neurologic dysfunction, including attention deficit disorder, learning disorders, and cerebral palsy" (Behrman et al., 2000, p. 1800).

Behrman, R. E., Kiegman, R. M., & Jenson, H. B. (2000). *Nelson textbook of pediatrics* (16th Ed.). WB Saunders.

Challenges Related to Retained Primitive Reflexes

- Brain and neurological immaturity, poor brain connectivity
- Sensory Processing Disorders (immaturity of the sensory systems)
- Poor coordination; motor deficits
- Poor stamina
- Weak core; easily fatigued
- Postural and balance deficits
- More effort needed to accomplish tasks
- Lack of emotional maturity
- Poor self-regulation
- Cognitive challenges

Retained primitive reflexes are associated with physical challenges

- Balance deficits (Bob et al., 2021; Niklasson, et al., 2017; Wahlberg & Ireland, 2005)
- Coordination issues (Gieysztor et al., 2020; Grzywniak, 2017, Niklasson et al., 2017)
- Gross motor deficits (Preedy et al., 2022, Pecuch et al., 2021, Gieysztor et al., 2018)
- Fine motor deficits (Brown, 2010)
- Abnormal walking gait (Gieysztor et al. 2020)
- Visual motor skills deficits (Domingo-Sanz, 2024; Domingo-Sanz, 2022; Andrich et al., 2018; Gonzales et al., 2008, McPhillips et al., 2000)
- Sensory disorders (Pecuch et al., 2020)
- Headaches (Wahlberg & Ireland, 2005)

Retained primitive reflexes are associated with social-emotional challenges

- Poor Attention and Opposition/Defiance (Hickey & Feldhacker, 2022)
- Weak emotional regulation (Grzywniak, 2017)
- Anxiousness (Carter, 2020; Forrest, 2002)
- Severe emotional and behavioral challenges (Taylor et al., 2020)

Retained primitive reflexes are associated with cognitive challenges

- Reading (Feldhacker et al., 2021; McPhillips & Jordan-Black 2007; McPhillips et al., 2000)
- Writing (Richards et al. 2022)
- Mathematics (Oliver, 2020)
- Developmental language disorder (Matuszkiewicz & Gałkowski, 2021)
- Dementia (Altunkalem Seydi et al., 2024)

Retained Primitive Reflexes Are Associated with ADHD

Numerous studies show that retained primitive reflexes are associated with ADHD.

- Rathod et al., 2024
- Wang et al., 2023
- Konicarova et al., 2014
- Taylor, 2004

Moro Reflex—Also called “Infant Startle Reflex”

- Emerges in utero, matured at birth and should be integrated at the age of 2-4 months.
- Stimulation—Sensory input from various sources can trigger a Moro reflex
- Movement Pattern—Rapid opening and upward motion of arms and legs with sharp intake of breath.
- Arms and legs return to flexed position, breath is released usually with a cry

Possible Challenges with Unintegrated Moro Reflex

- ADHD
- Anxiety
- Poor balance
- Poor core strength
- Poor stamina
- Motion sickness
- Visual Challenges
- Difficulty adapting to change
- Easily disturbed, irritable
- Sensory Issues: Hyposensitivity or Hypersensitivity to sensory stimuli—sounds, light, touch, vestibular input/ motion, smells
- Sleep disturbances
- Reactive, emotional outbursts
- Shyness, Social challenges
- Stuck in Fight/Flight states
- Learning Challenges

3 Reasons Why Moro Reflex Integration Is Key to Better Attention and Behavior

1. Moro—stimulated by multiple sensory inputs—full sensory integration cannot happen without Moro integration. Sensory disorders are associated with ADHD and behavior challenges
2. Fight or flight stress hormones make us more sensitive, hyper vigilant, reactive. Moro integration calms the fight-or-flight response by helping our nervous system mature to more regulated states
3. Moro linked to vestibular function—vestibular function linked to balance—better balance reduces anxiety improves self-esteem

ADHD Co-Occurring with Poor Rhythmic Ability

Gustafsson *et al. BMC Psychiatry* (2023) 23:920
https://doi.org/10.1186/s12888-023-05401-8

BMC Psychiatry

RESEARCH Open Access

The ability to maintain rhythm is predictive of ADHD diagnosis and profile

Peik Gustafsson[1†], Katarina Kjell[2†], Maurizio Cundari[3,4,5], Martin Larsson[3], Jenny Edbladh[6], Guy Madison[7], Olga Kazakova[3] and Anders Rasmussen[3*]

Gustafsson, P., Kjell, K., Cundari, M., Larsson, M., Edbladh, J., Madison, G., ... & Rasmussen, A. (2023). The ability to maintain rhythm is predictive of ADHD diagnosis and profile. *BMC psychiatry*, *23*(1), 920.

Challenges associated with atypical rhythm

- ADHD symptoms
- Speech and language disorders
- Developmental coordination disorder
- Dyslexia
- Autism

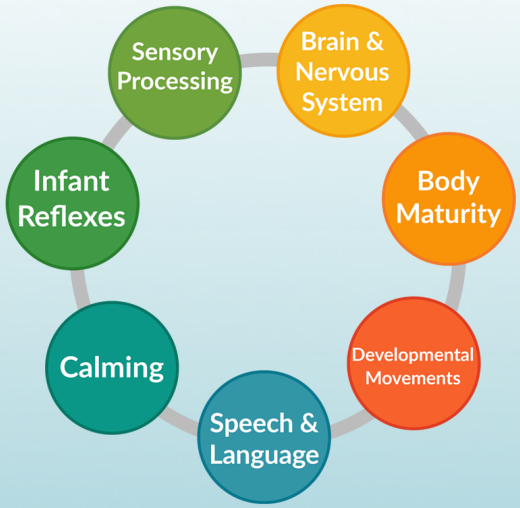
Lense, M. D., Ladányi, E., Rabinowitch, T. C., Trainor, L., & Gordon, R. (2021). Rhythm and timing as vulnerabilities in neurodevelopmental disorders. *Philosophical Transactions of the Royal Society B, 376*(1835), 20200327.

Description of an Innate Rhythmic Movement

Described by Esther Thelen, PT 1979 who studied healthy infants

- Spontaneous innate rhythmic movements
- Part of a repertoire of movements that infants automatically do as part of a development
- Provide calming, brain maturity, and reflex integration
- Sucking, rocking on hands and knees, and crawling, are familiar examples—there are many others.

Like primitive and postural reflexes, innate rhythmic movements are also essential to development



- Stimulate the tactile, proprioceptive, and vestibular senses to promote development (Blomberg, 2007; Blomberg & Dempsey, 2011)
- Associated with bursts in development (Thelen, 1979)
- Associated with bursts in speech development (Iverson, 2010)
- Integrate Primitive Reflexes (Hirose et al., 2025; Pérez Rey et al., 2024; Grigg et al., 2023)

Research on Innate Rhythmic Movements

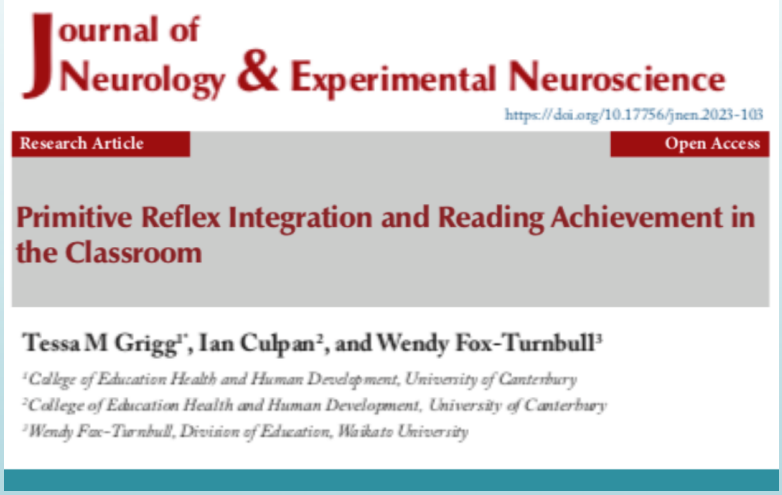
Associated with gains in:

- Primitive reflex integration (Hirose et al., 2025; Pérez Rey et al., 2024; Grigg et al., 2023)
- Reduced ADHD related behaviors (Hirose et al., 2025)
- Reading ability (Pérez Rey et al., 2024; Grigg et al., 2023)
- Balance (Pérez Rey et al., 2024)
- Self-regulation (Overvelde, 2022)
- Fine Motor Skills (Hirose et al., 2025)

Before and After—from Kyle, 5 years old

Kyle's mother did 10 minutes of passive innate rhythmic movements with him in between these drawings

RESEARCH: 5 min a day DOES make a difference!



Journal of Neurology & Experimental Neuroscience

https://doi.org/10.17756/jnen.2023-103

Research Article | Open Access

Primitive Reflex Integration and Reading Achievement in the Classroom

Tessa M Grigg[1*], Ian Culpan[2], and Wendy Fox-Turnbull[3]

[1]College of Education Health and Human Development, University of Canterbury
[2]College of Education Health and Human Development, University of Canterbury
[3]Wendy Fox-Turnbull, Division of Education, Waikato University

Innate Rhythmic Movements

5 min/day
4 days/week

- Integrate Primitive Reflexes
- Boost Reading Scores

Grigg, T. M., Culpan, I., & Turnbull, W. F. (2023). Primitive reflex integration and reading achievement in the classroom. *Journal of Neurology and Experimental Neuroscience, 9*(1), 18-26.

Peggy McCahan, OTA/L video interview

Children received Innate Rhythmic Movements
4 minutes per day, 5 days per week

Due to staffing shortages and high needs, Peggy had a huge caseload of 97 students.

10 students in a self-contained classroom were not able to receive direct pull-out services for IEP goals.

Instead, after one school quarter of daily rhythmic movements from the Brain and Sensory Foundations® program, ***"Every child made progress on their goals"***

Harald Blomberg, MD—Insights on ADHD

Inattention

- Trouble keeping attention
- Often does not seem to listen or follow directions
- Trouble organizing activities
- Easily distracted, forgetful

Hyperactivity

- Fidgets or squirms
- Unable to easily sit still
- "on the go", as if driven by a motor
- Often talks excessively

Impulsivity

- Blurts out answers before question is finished
- Trouble waiting one's turn
- Often interrupts or intrudes

ADD/ADHD is fundamentally a lack of brain, body, and sensory maturity resulting from a lack, or hindrance of, neurodevelopmental movements in early life

Co-Occurring Challenges with ADHD

Are Associated with Retained Primitive Reflexes

- Sensory disorders
- Motor deficits—balance, postural, gait
- Learning challenges
- Anxiety
- Headaches
- Speech Challenges
- Emotional and behavioral disorders
- Atypical Rhythm

ADHD and SPD Are Co-Occurring Challenges

Sensory Processing in Individuals With Attention-Deficit/Hyperactivity Disorder Compared With Control Populations: A Systematic Review and Meta-Analysis

Lucie Jurek MD, PhD [a b c], Arnaud Duchier MD [d], Christophe Gauld MD, PhD [e], Léonie Hénault MSc [a], Caroline Giroudon MSc [f], Pierre Fourneret MD, PhD [f], Samuele Cortese MD, PhD [c g h i], Mikail Nourredine MD, MSc [b c f]

Compared to controls: individuals with ADHD experience significantly higher:

- sensory sensitivity
- sensory avoidance
- sensory seeking
- low sensory registration

.

Jurek, L., Duchier, A., Gauld, C., Hénault, L., Giroudon, C., Fourneret, P., ... & Nourredine, M. (2025). Sensory processing in individuals with attention-deficit/hyperactivity disorder compared with control populations: A systematic review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*.

Sensory Processing Disorders are Associated with Behavior Disorders

Articles

The relationship between sensory processing difficulties and behaviour in children aged 5–9 who are at risk of developing conduct disorder

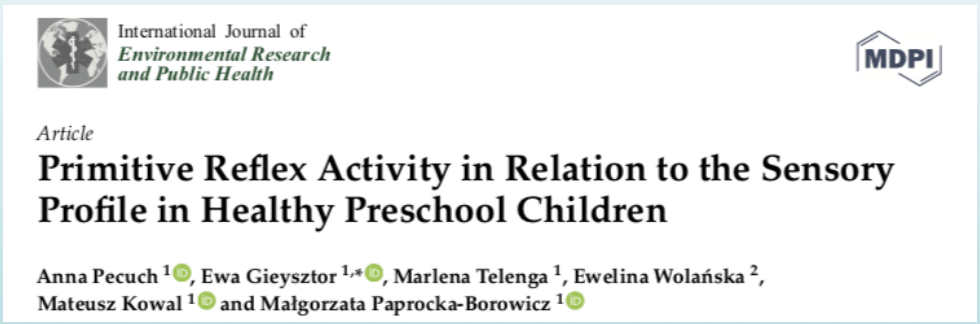
Cara Fox, Pamela C. Snow & Kerry Holland

Pages 71-88 | Published online: 07 Dec 2013

"Significant correlations were found between sensory processing difficulties and severity of behavioural problems."

Fox, C., Snow, P. C., & Holland, K. (2014). The relationship between sensory processing difficulties and behaviour in children aged 5–9 who are at risk of developing conduct disorder. *Emotional and behavioural difficulties*, *19*(1), 71-88.

Sensory Challenges are associated with retained primitive reflexes (RPR)



International Journal of *Environmental Research and Public Health*

MDPI

Article

Primitive Reflex Activity in Relation to the Sensory Profile in Healthy Preschool Children

Anna Pecuch [1], Ewa Gieysztor [1,*], Marlena Telenga [1], Ewelina Wolańska [2], Mateusz Kowal [1] and Małgorzata Paprocka-Borowicz [1]

Co-Occurring: ADHD with Emotional and Behavioral Issues

Prev Chronic Dis. 2006 Mar 15;3(2):A52.

Emotional and Behavioral Difficulties and Impairments in Everyday Functioning Among Children With a History of Attention-Deficit/Hyperactivity Disorder

Tara W Strine [1,✉], Catherine A Lesesne [2], Catherine A Okoro [3], Lisa C McGuire [4], Daniel P Chapman [5], Lina S Balluz [6], Ali H Mokdad [7]

"Children with a history of ADHD were 6 times as likely as those without ADHD to have a high level of overall difficulties including emotional, conduct, and peer problems…"

Strine, T. W., Lesesne, C. A., Okoro, C. A., McGuire, L. C., Chapman, D. P., Balluz, L. S., & Mokdad, A. H. (2006). Emotional and behavioral difficulties and impairments in everyday functioning among children with a history of attention-deficit/hyperactivity disorder. *Preventing chronic disease, 3*(2), A52.

Emotional and behavioral issues are linked to RPR

the british psychological society
promoting excellence in psychology

British Journal of Educational Psychology (2020), 90, 719–735

www.wileyonlinelibrary.com

Motor problems in children with severe emotional and behavioural difficulties

Bronagh Taylor[1], Donncha Hanna[1] and Martin McPhillips[2]*
[1]Queen's University, Belfast, UK
[2]Edge Hill University, Lancashire, UK

Motor skill deficits and the presence of ATNR were each independent predictors of EBD in children.

Innate Rhythmic Movements Help Severe Behavior

"I had one of my patients begin doing the rhythmic movements 6 weeks ago. This child is 8 years old and attends a special school for emotionally and behaviorally challenged children that can't attend regular public education. When he gets frustrated at school, it typically results in a major melt down with hitting, throwing desks and chairs, and yelling. He has had 4-5 adults holding him down on the floor at times. **This boy has not had hardly any behavior or emotional outbursts like I described since he has started doing the rhythmic movements at home or at school.** He has already **made great gains with balance, coordination, sensory processing, impulse control, and frustration tolerance and it has only been 6 weeks. Amazing!!"**

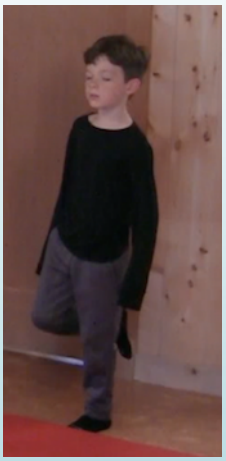
H.S., Occupational Therapist, emphasis added

Co-Occurring: ADHD, Balance, and Postural Deficits

Balance Deficit and Brain Connectivity in Children with Attention-Deficit/Hyperactivity Disorder

Sun Mi Kim[1], Gi Jung Hyun[1], Tae-Woon Jung[2], Young Don Son[3], In-Hee Cho[4], Baik Seok Kee[1], and Doug Hyun Han[1]

"Children with ADHD had disturbance of balance… Decreased brain connectivity from the cerebellum to the premotor cortex and anterior cingulate was associated with disturbances of posture and balance in children with ADHD."



Kim, S. M., Hyun, G. J., Jung, T. W., Son, Y. D., Cho, I. H., Kee, B. S., & Han, D. H. (2017). Balance deficit and brain connectivity in children with attention-deficit/hyperactivity disorder. *Psychiatry Investigation, 14*(4), 452.

Balance and postural deficits are associated with RPR

Photos from Kathleen Porter, author of *Healthy Posture for Babies and Children* kathleenporter.com

Photo accessed at: https://projectyourself.com/

Infante-Cañete et al., 2023; Jeong et al., 2021; Grzywniak, 2017; Niklasson et al., 2017; Wahlberg & Ireland, 2005

Better balance lowers anxiety, increases self-esteem

Bart, Orit; Yair Bar-Haim; Einat Weizman; Moran Levin; Avi Sadeh; Matti Mintz

Research in Developmental Disabilities, 30, 486–495, 2009

ELSEVIER

Research in Developmental Disabilities

Volume 30, Issue 3, May–June 2009, Pages 486-495

Balance treatment ameliorates anxiety and increases self-esteem in children with comorbid anxiety and balance disorder

Orit Bart [a], Yair Bar-Haim [b], Einat Weizman [a], Moran Levin [a], Avi Sadeh [b], Matti Mintz [c]

[a] Department of Occupational Therapy, Tel-Aviv University, Tel Aviv 69978, Israel
[b] The Adler Center for Research in Child Development and Psychopathology, Department of Psychology, Tel-Aviv University, Israel
[c] Psychobiology Research Unit, Department of Psychology, Tel-Aviv University, Israel

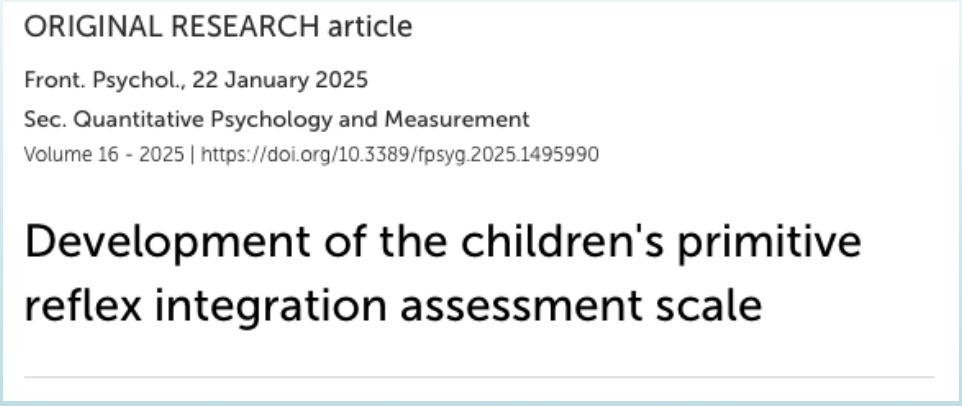
Should All Children Be Assessed?

- Check balance ability
- Check motor skills
- Check sensory processing
- Check rhythmic ability
- Check visual motor skills
- Check individual reflexes

Unintegrated Primitive Reflexes Are Prevalent in Young Children

- In a study of 120 apparently healthy children (ages 3-8) without neurological disability in Córdoba, Spain, 89.5% had incomplete neurodevelopmental movements (León-Bravo et al., 2023).
- Out of 120 school children in the UK (ages 4-5), only three had no signs of motor abnormality (Goddard Blythe, et al., 2022).
- In a study of 53 children (5-7 years old), 100% had at least one retained reflex (Feldhacker et al., 2021).

Children's Primitive Reflex Integration Assessment Reliable Measurement Scale



ORIGINAL RESEARCH article

Front. Psychol., 22 January 2025

Sec. Quantitative Psychology and Measurement

Volume 16 - 2025 | https://doi.org/10.3389/fpsyg.2025.1495990

Development of the children's primitive reflex integration assessment scale

Wang, M., Yu, J., Li, H., Zhao, C., Li, Y., & Yang, X. (2025). Development of the children's primitive reflex integration assessment scale. *Frontiers in Psychology*, *16*, 1495990.

Neurodevelopmental Movements Develop our Balance Skills

By the toddler age, a child can ideally move the head up and down—without any loss of balance and without compensatory movements of limbs and trunk.

Primitive Reflex Integration Improves Posture, Balance, and Concentration

Effects of Primitive Reflex Integration Exercises on Forward Head Posture, Balance, and Concentration in Children with Neurodevelopmental Disability : A pilot study

Ji-Ung Jeong, PT[1] · Han Choi[2] · Suk-Chan Hahm, PT, Ph.D[3+]

Journal of The Korean Society of Integrative Medicine, 2021, 9(4), 29~38
https://doi.org/10.15268/ksim.2021.9.4.029

"…**primitive reflex integration exercises were a useful intervention to improve forward head posture, balance, and concentration** in children with neurodevelopmental disability."

Improvements in physical skills and sensory processing associated with primitive reflex integration

- **Vestibular maturity** (Stephens-Sarlós, 2024)
- **Visual motor skills** (Domingo-Sanz, 2024; Domingo-Sanz, 2022; Andrich et al., 2018; Gonzales et al., 2008; McPhillips et al., 2000)
- **Visual and auditory processing** (Stephens-Sarlós et al., 2024, August)
- **Balance** (Infante-Cañete et al., 2023; Jeong et al., 2021; Grzywniak, 2017; Niklasson et al., 2017; Wahlberg & Ireland, 2005)
- **Coordination** (Grzywniak, 2017; Niklasson et al., 2017)
- **Motor skills** (Infante-Cañete et al., 2023; Pecuch, et al., 2021)
- **Fine motor abilities** (Hirose et al., 2025; Brown, 2010)
- **Posture** (Jeong et al., 2021)

Improvements in social-emotional functioning and behavior associated with primitive reflex integration

- **Social-emotional functioning in children** (Grigg et al., 2018; Grzywniak, 2017)
- **Self-regulation** (Overvelde, 2022)
- **Increased well being in adults** (Stephens-Sarlós et al., 2024, September)
- **Reduction in behaviors associated with ADHD** (Hirose et al., 2026)

Improvements in cognitive and learning skills associated with primitive reflex integration

Reading (Grigg et al., 2023; McPhillips & Jordan-Black 2007; Wahlberg & Ireland, 2005; Jordan-Black, 2005; McPhillips et al., 2000)

Reading fluency and reduction of headaches (Wahlberg & Ireland, 2005)

Oculo-motor and reading skills (Bein-Wierzbinski, 2001, as quoted in Goddard, 2005)

Mathematics and Reading (Jordan-Black, 2005)

Copying ability [fine motor] (Brown, 2010)

Writing speed (McPhillips et al., 2000)

Concentration (Jeong et al., 2021)

Cognitive function in adults (Stephens-Sarlós et al., 2024, September)

Extreme sensitivity, motor skills, and social skills improve

Submitted by Terran Daily, Occupational Therapist

Finn is a 7-year-old boy who has had extreme sensory sensitivity. Last January, he screamed and cried about going into public restrooms because of the hand dryers, and would run out when the hand dryer came on. He wouldn't let the barber get near him with a buzz cutter, even to just clean up the back of his neck, and he ran away to sit on the couch when anyone vacuumed at home.

"In February, his mom started doing rhythmic movements with him, along with integration of the TLR and hand reflexes. Within about a month, Finn was able to tolerate the buzz cutter on his entire head and was wanting to use some less forceful hand dryers, but he was still afraid of the vacuum cleaner. Mom continued with rhythmic movement over the summer, and we recently added integration of the fear paralysis and Moro reflexes. Now look—Finn is the one vacuuming!"

And sensory sensitivity is not the only thing that has improved. Finn had very significant problems with motor skills, self care and social skills as well. Initially he was completely dependent in dressing. Now he can dress himself, apart from some closures, last week he even unbuttoned his own shirt. In January, he was unable to balance on one leg or hop. Now he can balance up to 10 seconds on one leg and hop 15+ times. When we started, Finn was unable to isolate finger movements and held his pencil in a dagger grasp. Now he can touch each fingertip to his thumb, and he holds his pencil in a good tripod grasp. In January, he could sit in circle time about 30 seconds before he began throwing things and crawling over the other children. He can now usually participate meaningfully in group activities for 30-40 minutes, taking turns, following instructions and respecting other children's space.

Important Principles for Applying Rhythmic Movements

- Establish a comfortable position for both giver and receiver.
- Draw out the rhythm that feels best to the one we are working with.
- ASK FOR FEEDBACK on strength, tempo, hand positioning, range of motion, etc.
- Passive rocking movements should be pleasant for both giver and receiver.
- For those who are non-speakers, be aware of facial expression, change in breathing, etc.
- Facilitator is present and positive
- Ideally there is a relaxation response

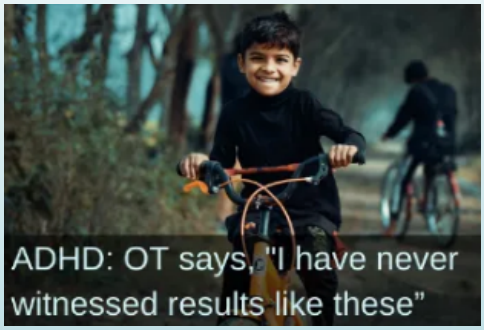
Innate Rhythmic Movements
Gateway to Motor Development

"The rhythmic movements have been integrated into our practice with most success to increase functional engagement when the kiddos can't seem to relax otherwise.

—amazing results where other interventions were not even close to helping. The kiddos love the "work" and the parents are relieved to find bedtime movements that relax everyone!"

Trish LaCour, OTD, OTR/L (emphasis added)

In 2 months, OT sees "profound improvements" across multiple areas



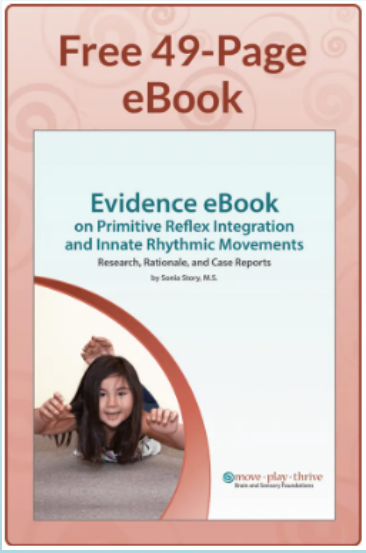
Submitted by Alison Randolph, OTD, OTR/L, ATP

Messy writing	Handwriting has "changed for the better tremendously"
Poor attention span	Focusing well; starting and finishing tasks on his own
Anxious	Calm, happy, and stress-free
Self-restricted diet	Trying new foods
Sleep difficulties	Able to calm down at night and lie down in a restful state before bed
Impatient; mood swings	Demonstrating more patience; much less angry
Incorrect pencil grip	Pencil grasp is maturing; arm now rests on the surface when writing
Slumping posture	Now walks upright
Poor motor skills	Dramatic improvements in balance and coordination
Headaches from muscle tension in the neck	Far fewer headaches
Obsessive compulsive tendencies	Obsessive-compulsive tendencies have completely resolved
Poor short-term memory	Short-term memory has improved
Extreme fear of failure, perfectionism	Taking chances without fear
Poor eye contact	Now looks others in the eyes
Sensitivity to sound	Sounds are no longer an issue

Get Your Free Resources: MovePlayThrive.com

Reflex Integration Checklist

Free 49-Page eBook



New Chapters Updated in 2026!

Where to Learn More

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Approved Provider

Move Play Thrive
Approved Provider for Physical Therapy CEUs

ASHA CE
APPROVED PROVIDER

National Board for Certified Counselors

National Certification Board for Therapeutic Massage & Bodywork

MovePlayThrive.com