A Neurodevelopmental Approach to Dyslexia: The Impact of the ATNR Reflex on Reading Fluency

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Background and Problem

Many research studies have pointed to a correlation of students with reading difficulties and retained primitive reflexes (Hazza et al., 2023).
The Asymmetrical Tonic Neck Reflex (ATNR) is closely linked to dyslexia due to its impact on a child's development. When the ATNR is retained, it can disrupt motor skills and coordination, which are crucial for reading and writing. This disruption often leads to difficulties with hand-eye coordination, balance, and bilateral movements. Additionally, a retained ATNR can impair visual tracking, making it challenging for children to follow text smoothly, thus affecting reading fluency and comprehension (Wang et al., 2023).
Though these studies discuss correlations there is limited research on the impact of treating the symptoms of dyslexia with the use of primitive reflex integration exercises.

The Neurodevelopmental frame of reference functions as the guiding model for this capstone project. Primitive reflexes that are not integrated are believed to disrupt the central nervous system, thus impairing the body's ability to conduct signals from the brain (Enabnit & Warren, 2023).

Purpose/Aim/Question

Purpose: To evaluate the effectiveness of treating a retained Asymmetrical Tonic Neck Reflex (ATNR) on reading fluency in and 11-year-old student with dyslexia.

Aim: To determine if integrating the ATNR through targeted exercises improves reading fluency in a student with dyslexia.

Question: Does the integration of the Asymmetrical Tonic Neck Reflex through targeted exercises enhance reading fluency in an 11-year-old student with dyslexia?

Method

Setting:
This Capstone project took place in a home office with access to technology with specific instructions, and visuals. This space was utilized for daily primitive reflex exercises, pretest and posttest data collection. This environment was free from distractions.

Participants:
The single subject was an 11-year-old boy, diagnosed with dyslexia and a retained primitive ATNR reflex.

Instrument Used:
Assessment materials utilized included the ATNR quadruped test and the DIBELS test for reading fluency.

Procedures:
Pretest and post test data was collected utilizing the DIBELs test for reading fluency as well at the ATNR quadruped primitive reflex test. A four-week intervention phase took place, in which the student completed exercises to assist in integration of the ATNR reflex. During the intervention phase, a variety of exercises were conducted. These included the lizard crawl exercise, which helps with transitional movements and coordination; Cat-Cow stretches to enhance spinal flexibility and coordination; neck stretches to reduce tension and improve range of motion; cross-crawls; and figure eights, which involve drawing large eights in the air to promote hand-eye coordination and midline crossing. Each exercise was performed for ten repetitions over a period of four weeks.

Data Analysis:
Data was analyzed by utilizing before and after comparison for both percent of growth and improvements in words per minute read. A comparison of the presence of a retained vs integrated reflex were reported pretest and posttest.

Results

Improvements in both reading fluency and the integration of the ATNR reflex were noted with primitive reflex integration exercises.

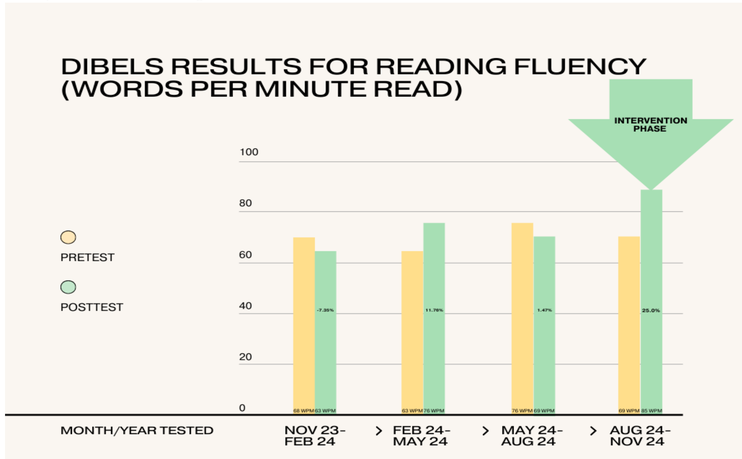

Figure 1. DIBELs results. This chart demonstrates the progress over a year time frame with and without primitive reflex integration intervention

ATNR Quadruped Test

Experiment Week	Retained ATNR	Integrated ATNR
Week One	✓	
Week Two	✓	
Week Three		✓
Week Four		✓

Figure 2. Presence of retained vs integrated ATNR reflex**.**

Conclusions

Effectiveness of ATNR Exercises
Reading Fluency Improvement: The integration of the ATNR reflex through targeted exercises supported the student's reading fluency, with the largest growth observed during the four-week experimental period. Notable improvements were seen as early as two weeks into the experiment.
Broader Benefits: The student reported easier classroom assignments, increased confidence in reading grade-level texts, and improved dribbling and ball-handling skills during sports, indicating benefits beyond reading.
Study Limitations:
Sample Size and Duration: The study's small sample size and short four-week duration limit the generalizability and long-term applicability of the findings.
Control Group and External Factors: The absence of a control group and the lack of consideration for external factors that might have influenced the student's improvements are significant limitations.
Conclusion
The success of this intervention highlights the importance of early, targeted, and holistic approaches in occupational therapy, suggesting that ATNR exercises could be integrated into regular educational and therapeutic practices to support diverse learners.

Implications for Occupational Therapy

Integrating ATNR Exercises into Occupational Therapy
Key Points:
Rapid Improvements: Early intervention and holistic approaches are crucial

Research & Training: Enhance effectiveness through further research and specialized training

Comprehensive Support: Address academic and physical challenges in OT practices
Promoting Success:
Publish Research: Share findings in journals

Present at Conferences: Highlight benefits and methods

Workshops & Training: Educate therapists and educators

Social Media: Share success stories

Collaborate: Implement pilot programs in schools and healthcare settings
Further Research:
Solidify Evidence: Conduct more studies

Refine Techniques: Adapt for diverse populations

References

Enabnit, A., & Warren, A. (2023, August 9). *Primitive reflexes: Development, function, and evaluation.* DoveMed. https://www.dovemed.com/health-topics/focused-health-topics/primitive-reflexes-development-function-and-evaluation

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