

Auditory Temporal Sampling Activation and Phonological Awareness

Three Year Longitudinal Study | 5 to 12 Years Old

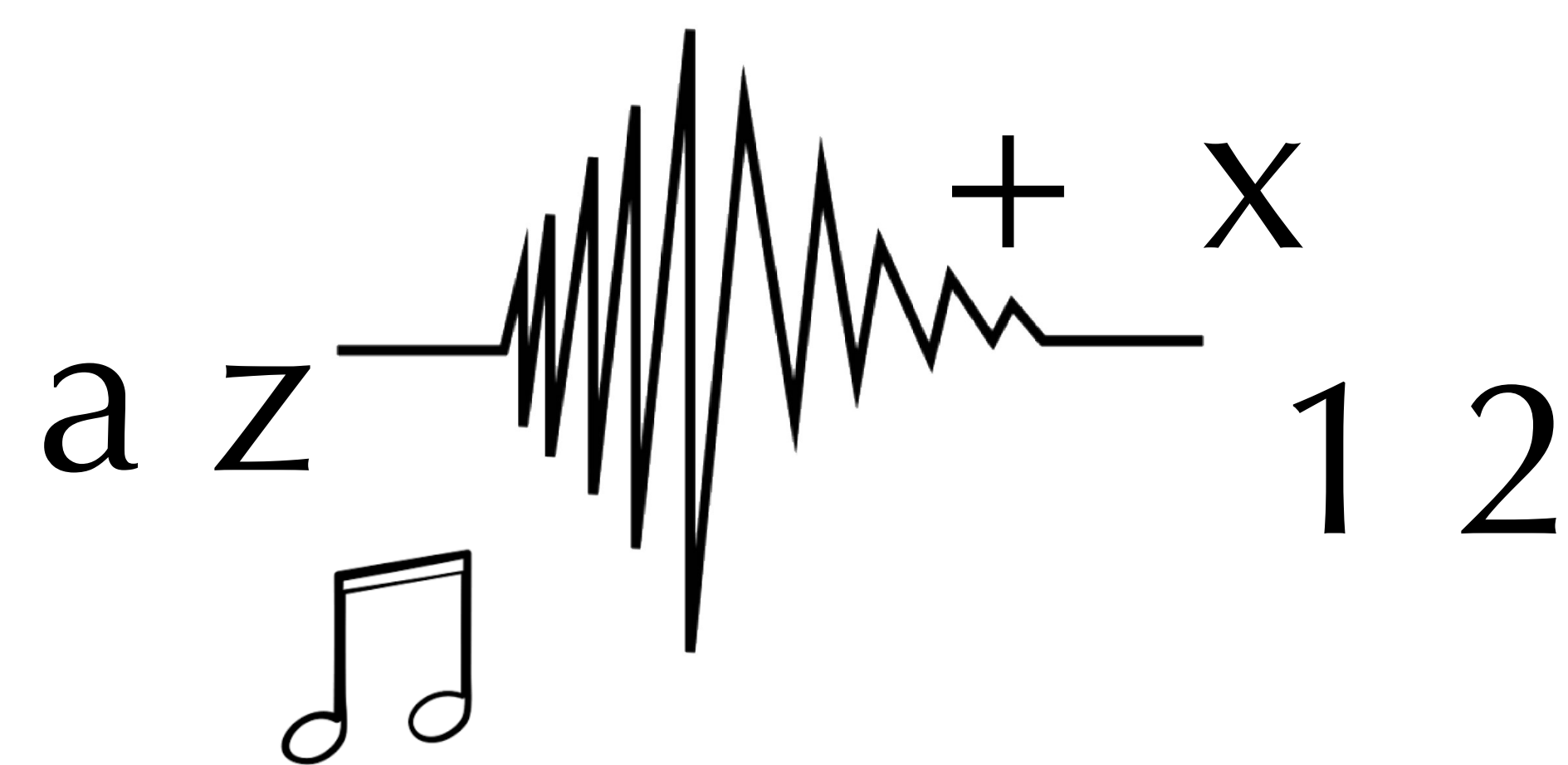
Research Proposal [Presentation]

[Abstract below]

Auditory Temporal Sampling Framework helps modulate inner ear sound frequencies through a subfunction of Amplitude Rise Time (ART).

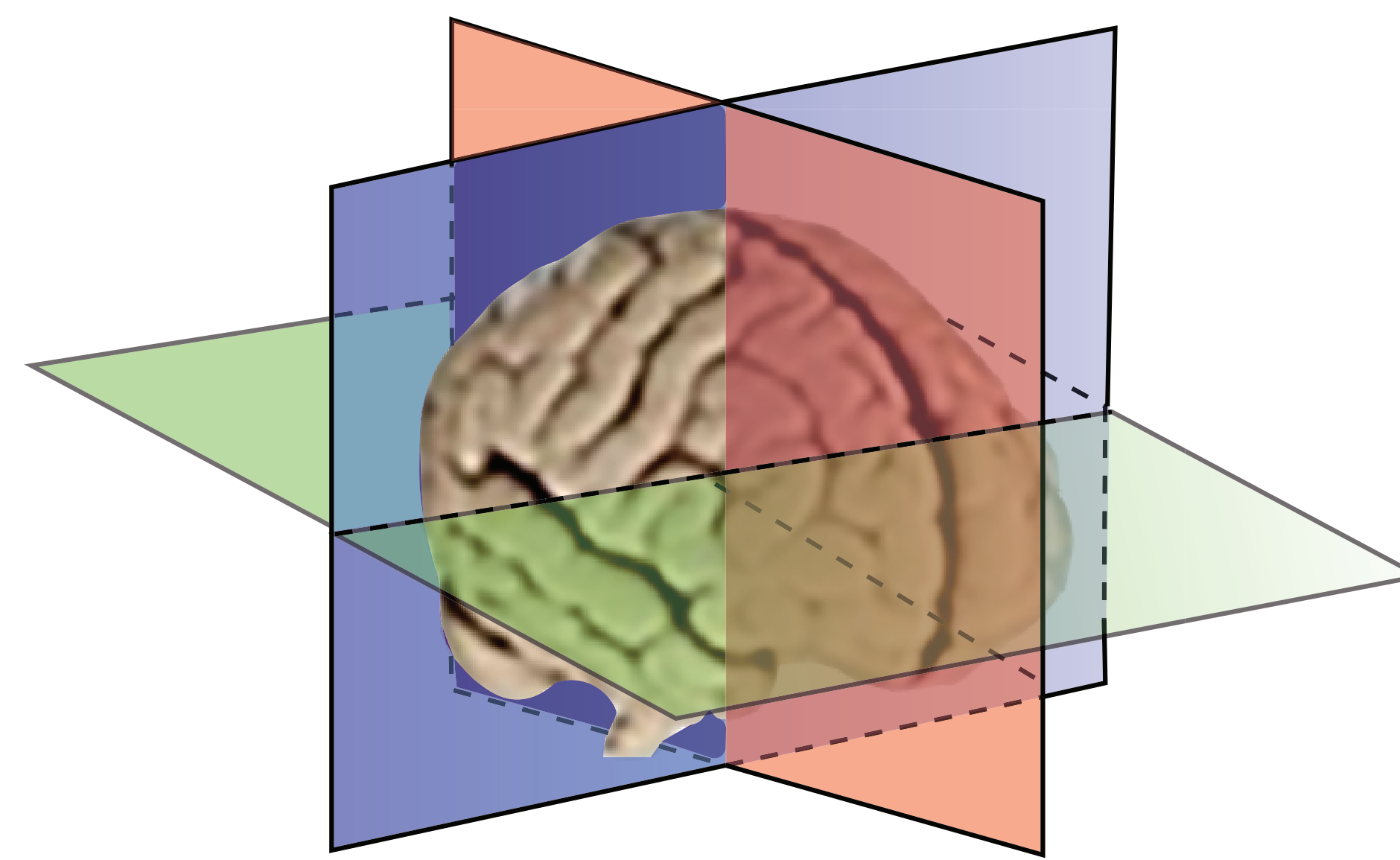


When individuals have a higher than average ART, it takes them longer to perceive and act on incoming sounds leading to the phonological differences found in Dyslexia, Dysgraphia, and Written Expression difficulties.



Ideally, all phonemes (or sounds) are then mapped to graphemes (letters or symbols) with reading, writing or math processing.

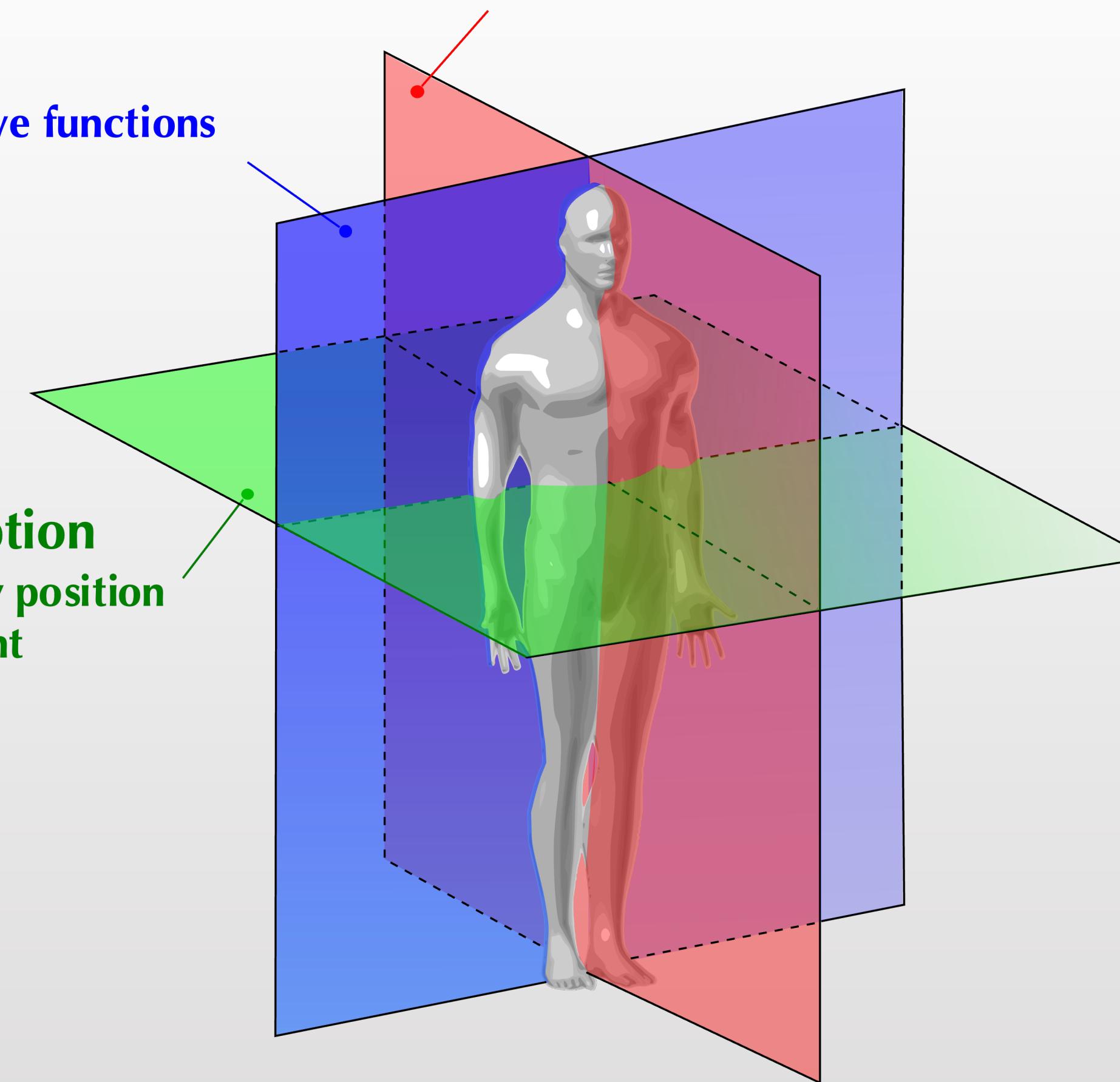
Phonological awareness becomes automatic for optimal fluency in academic areas.



Auditory balance
Temporal Sampling Framework activation

Focus
Executive functions

Proprioception
Sense of body position and movement



Movement crossing the midline activates three imaginary planes representing **auditory balance, proprioception** and **focus**. Auditory Temporal Sampling Framework is activated as a result, then phonological awareness, and finally improved academic performance.

Notice how all planes intersect the body and neural midline. Therefore all planes are activated by movement.

Since Reading, Writing and Math share phonologic areas of the brain with assistive focus elements, all areas benefit from movement activating the Temporal Sampling Framework.

The purpose of this project is to validate how

- 1) Dennison's *Brain Gym* movements activate
- 2) Temporal Sampling Framework (TSF) and phonology
- 3) and increased academic fluency

Groups include

- 1) Students with learning differences/average or gifted IQ
- 2) Control groups have students *without* learning differences/average IQ
- 3) *and* students *without* learning differences/gifted IQ

Students aged 5-12 from three different SES groups—suburban, urban, and rural, 1600 per group—in up to three areas of the country are part of the study. St Louis, MO | Fairfax, VA | Santa Barbara, CA districts

Testing occurs outside school hours in a homework help center with occupational therapy (i.e. homework/movement), speech and language services (i.e. homework/audiology). We hope to find improved academic scores expected after *Brain Gym* movements and the autoregressor studies verify data.

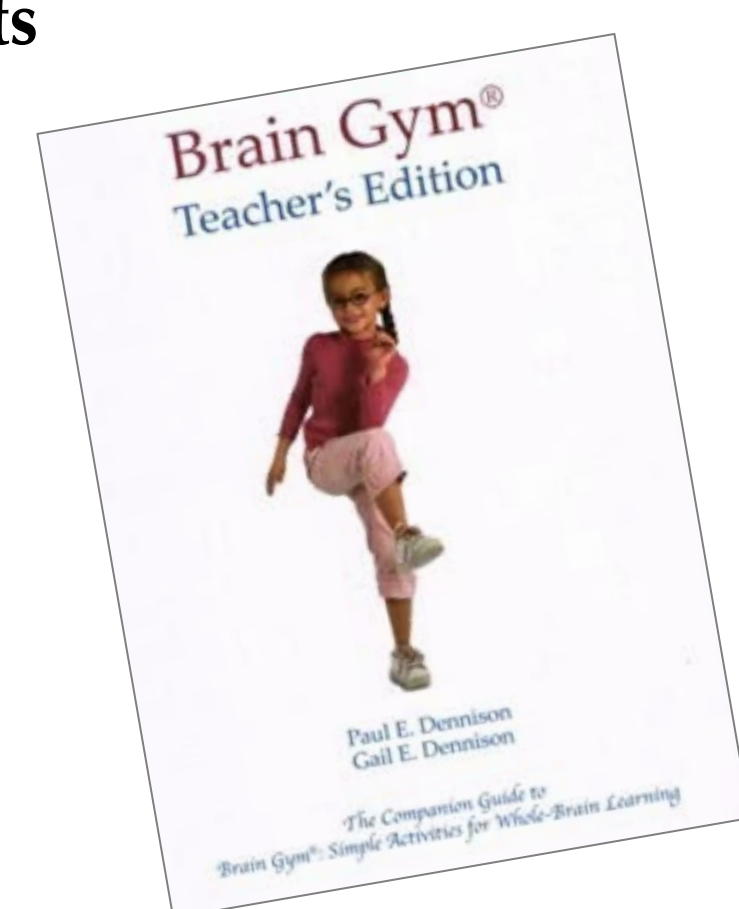
This will build on

- 1) prevention/intervention techniques
- 2) meta-analysis of learning differences
 - a) movement/TSF functions underlying Dyslexia/learning differences
 - b) auditory-specific and occupational therapy movement exercises
 - c) more effective phonological screeners—infants through adulthood, and English speakers/native languages.

Movement Learning Solutions

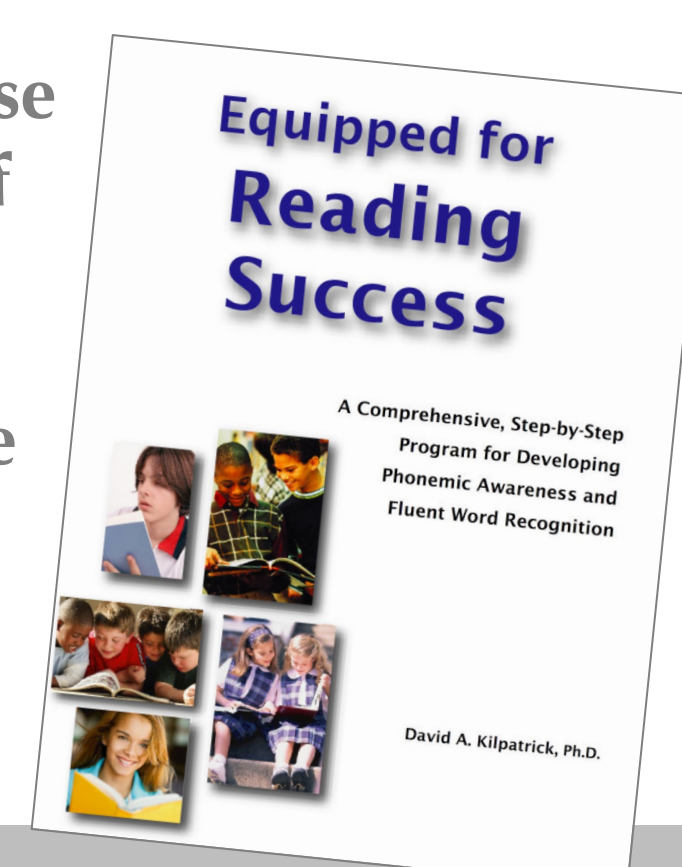
Brain Gym—Movements That Cross the Midline

- Calming body
- Clearing mind
- Focusing mind
- Energizing thoughts
- Brain Breaks with hydration
- Worldwide success



Equipped for Reading Success Builds Advanced Phonemic Awareness (APA)

- Explicitly taught for those that need APA as part of Structured Literacy
- Add movement with a minitrampoline, balance ball or balance beam



Novel Engineering www.novelengineering.org/

- Combines Literature and STEAM
- Developed by Tufts University
- Multi-sensory and exploratory learning
- Develop inter-disciplinary connections easily



Karaoke for Fluency Development

- When students sing they are forced to keep their voices up to a certain rate.
- Amplitude Rise Time [a measurement of time to perceive sound] leads to successful phonologic development.
- Speech therapists use this technique for phonologic development.
- Kaminski reports a group of elementary students improving their reading scores by a year when participating in only three months of after school Karaoke Club instruction (2021).



talkingfingers.com/read-write-type/

- Students develop fluency as they hear the computer's phoneme sounds, and see the letters they type.
- Kinesthetic and tactile keyboarding
- Helps students master Advanced Phonemic Awareness
- Reading, writing, spelling, vocabulary, punctuation and keyboarding are taught simultaneously.

