



Research Article

The Use of Rhythm and Drumming to Improve Reading Fluency and Comprehension

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Abstract

Reading fluency and comprehension are important factors in many markers of success later in life including health, employment and addiction. Reading programs have historically shown poor results in improving levels of reading. In this research, we applied a novel approach involving the use of drumming and rhythm to unlock the literacy potential of struggling students. Two hundred and ninety-three subjects were recruited from detention camps and juvenile hall, while 25 4th grade public school students comprised the other training. The *Reading & Rhythm* program was presented over a six-week period. Results of the study demonstrated significant improvement in both reading fluency and reading comprehension. These results show great promise for a program that can help students improve reading literacy and thus give them support and a greater opportunity for future success.

Introduction

Reading fluency and comprehension are important components in the future success of young students. Research has shown that adults who exhibited reading difficulties during their childhood have many struggles in life. This includes increased levels of addiction [1,2], unemployment and lower income [3-5], and poor health [6]. The unemployment rate has been shown to be 23% for those with very low literacy and 17% for those with low literacy, compared to 4% for those with good literacy [7].

The education system has not been effective in remediating these poor results and impediments to future success. A long-term study by the Annie E. Casey Foundation found students who were not proficient in reading by the end of third grade were four times more likely to drop out of high school than proficient readers [8]. The corollary of this is that students who drop out of high school are three and a half times more likely to be arrested than graduates [9]. And while those with the lowest reading scores nationally, account

for just a third of students overall, this group accounts for more than 63% of all children who do not graduate from high school [8].

About 130 million adults in the U.S. have low literacy skills according to a Gallup analysis of data from the U.S. Department of Education. This means more than half of Americans between the ages of 16 and 74 (54%) read below the equivalent of a sixth-grade level [10].

There are many postulated reasons for poor reading ability. One line of thinking suggests that a stressful and traumatic childhood creates conditions that interfere with learning [11,12]. Nicholas Kristof, the author of a recent opinion piece in The New York Times titled *Two Thirds of Kids Struggle to Read, and We Know How to Fix It*, reflects on the number of current students who are not proficient in reading [13]. The article mentions that there is growing understanding that students' social and emotional competencies play a strong role in their ability to read up to their potential [13]. In addition, Stephen Krashen, Emeritus Professor

of Education at the University of Southern California, has studied how anxiety, low self-confidence, and negative expectations of success all influence students' language-learning experiences," and this is especially so for non-native English speakers [14]. Thus, research focusing on how Social Emotional Learning (SEL) skills can derail reading success, especially among students having difficulty, are becoming more and more prevalent in reading research [14].

Many popular reading programs also fail to deliver successful strategies to struggling readers for literacy success. For example, critics of the popular *Reading Recovery* program note that children "are taught to use context, pictures and other clues to identify words, a strategy that may work in first-grade books but becomes less effective as text becomes more difficult" [15]. Thus, children may seem like good readers in first grade but fail to develop the skills they need to be good readers long-term.

In addition to developing word-level strategies, readers simultaneously build their phonological awareness. Phonological awareness is a skill that allows individuals to recognize and work with the sounds of spoken language. In the article "Why Phonological Awareness Is Important for Reading and Spelling" Dr. Louisa Moats and Dr. Carol Tolman emphasize that weak phonological processing skills are a predominant factor contributing to poor reading abilities in pupils [16]. Phonological Awareness (PA) skills include words in sentences, rhyme sensitivity, onsets/beginning sounds, phoneme segmenting and blending and phoneme manipulation.

Interestingly, instead of the familiar "stair steps" of phonological awareness emphasizing a linear order to the developmental progression of PA skills, new research on phonological awareness progression was presented by Karen Kehoe, Ph.D and Melinda Hirschmann, Ed.D. from Middle Tennessee State University, at the Academic Language Therapy Association (ALTA) 2024 conference [17]. Hirschmann emphasized that phonological development was not the usual "stair steps" of linear developmental progression with each skill to be mastered in sequential order but rather like waves "to help remind us that these phonological awareness skills will very often not develop sequentially and that they can overlap and reach back and support and build in a very fluid way" [17]. This fluidity of phonological awareness development, likened to the motion of the waves, directly supports the technique that is the rhythm of reading [18]. The ebb and flow of rhythm expands the tempo of language patterns building students' listening sensitivity as they acquire phonological acumen at all levels.

A Novel Approach

Incorporating Social Emotional Learning (SEL) into literacy instruction and listening to the sounds of language to build that phoneme-grapheme relationship, is *Drumming for your Life's*

(DFYL) unique approach to reading instruction. DFYL has developed a one-of-a-kind literacy program to engage students in a multi-sensory way to overcome significant obstacles to reading. The DFYL program uses the term, Neurological Dissonance® to refer to the struggles of the students. Neurological Dissonance® results from the students' environmental stresses and trauma that create conflictual internal "chatter" around fears, concerns, and judgments that are a continual source of distraction from their full engagement and thus, their ability to learn. This distraction causes a loss of focus, emotional pain, and dissociation, along with body tension. Students, in essence, are unable to listen to language impacting both fluency and comprehension. To remediate the behavioral and emotional distress that interferes with learning, DFYL has developed an approach that uses drumming to create what is described as "Neurological Harmonic Resonance," which is a rhythmic synchronicity between mind and body,

One of the most influential research-based websites is *Reading Rockets* [19]. Numerous research articles have been cited by *Reading Rockets* over the years in support of a multi-sensory approach to improving phonemic awareness, phonics, and reading comprehension skills. Multi-sensory instruction incorporates listening, speaking, reading, and a tactile or kinesthetic activity simultaneously. By using multi-sensory strategies, teachers can engage and sustain the attention of all students [20].

In DFYL, a multi-sensory approach with a facilitator who is drumming a consistent rhythm on a book, supports the students' ability to be more present, engaged, and in finding their own rhythm as they read. DFYL refers to this rhythmic state of mind as "riding the wave." The rhythmic pattern helps support the development of neural pathways in the brain that are necessary for both focus and concentration by the reader. The repetitive patterning helps the reading network pathways, so students begin to feel confident in focus and reading success. The rhythm moves them out of their distracted patterns of Neurological Dissonance® and shifts from the Doubtful Internal Voice® referred to by DFYL, to the "I Got This" confident voice.

As students build their focus and confidence, the next step in the Reading & Rhythm process is increasing the tempo to further internalize their new reading and the neural networks associated with it. The idea is that the establishment of this new behavior and focus will increase reading fluency.

Procedures

Subjects:

Subjects in the first cohort were 293, 9th through 12th graders recruited from 10 detention camps and 4 juvenal halls in Los Angeles County. Students were selected based on significantly below grade level reading ability. Students were selected by the

school administrators and probation officers at the juvenile halls and detention camps based on the students' low scores as well as behavioral issues. In addition, a second cohort were 25 students from a 4th grade class at the Charles C. Cashman Public Elementary School, in Amesbury, Massachusetts.

Methodology:

The program for the 293 students were led by DFYL facilitators while the teacher of the 4th grade class was trained in the Reading & Rhythm program and was facilitating the program for the first time with her class.

There were two classes per week for six weeks, thus a total of 12 classes. Each class was one hour in duration. During Class 1 students were pre-tested for fluency and comprehension using a national testing system [21].

The program was initiated during the second class. The class began by teaching the 7 Reading & Rhythm Rules, (described below). This is followed by teaching the "Pulse Beat" (described below) followed by the Reading & Rhythm Beat (described below). Next is the group read, followed by individual reading with the "One Sentence, Five Times" technique with each student. We take up to 7 words and the facilitator starts with the Reading & Rhythm Beat at a slow tempo and then has the student repeat the 7 words a little faster each time. After the fifth time we have the reader continue reading the rest of the passage. This is a process that creates activation. The Facilitator tracks the students using the Reading & Rhythm Beat, slowing down and speeding up when necessary and also using the 7 rules to help students focus on good reading habits. As an example of the technique, if a student repeats a word we say "don't repeat" while they're reading, to break the habit.

The One Breath technique was introduced in the 3rd class. According to grade level we have each student start with reading 9 to 11 words in one breath. We increase the number of words as the sessions continue. Thus, in session 5 they read 18 words per breath, and then in class 6 it's 22. We used the breathing exercises for 4 lesson plans.

During the 3rd class we introduced comprehension, which is called Non-Linear Comprehension Strategy in which the reader thinks like a writer, helping them put the story together. The process starts with "Close your eyes, trust yourself: What's the first thing that pops to you from what you just read? First thing." What pops up could be from anywhere in the story and that's where we start. We never use the word remember, which can be a trigger. The subconscious mind becomes a partner in the learning process.

Next, they received the second question, which is: "Where did it pop up for you.?" Now the mind starts organizing the story in a linear way. The third question is: "Why did it pop up for you.?" Making their connection to the story. Then the fourth question is:

"Why is it important to the story.?"

We ask these first 4 questions in each class. In subsequent classes we ask the following questions: "Are there any personality traits in any of the characters that are similar to yours?" "Talk about the other characters." "Talk about the setting." "Ask about the action." "What is the main idea?" "What is the theme?" "What will happen next?" "What are the clues that led you to believe this?"

In class 5 we shift to the One Sentence Three Times technique for fluency. Starting at mid-tempo for up to 7 words, then faster for the 2nd and 3rd time and after the 3rd time continue reading the passage. Beginning in class 8 each student reads straight through the passage without repeating the first 7 words. As an example of how the 7 Rules are used, if a student repeats a word we say "don't repeat" while they're reading to break the habit. Starting in class 8, the student plays the Reading & Rhythm Beat with the facilitator before he/she starts to read for a few seconds then the facilitator continues the beat as the student begins to read. On the 12th class they complete the post-test for fluency and comprehension test.

During our Reading & Rhythm program, when students miss a word, we go back and do the "See it, Say it, Play it" technique. We teach the natural rhythm of words but with rhythmic energy we give power and life to each syllable. For example: The word "comprehension," has 4 syllables: com-pre-hen-sion, with the accent on the third syllable. We See, Say and Play the word, 5 times so they remember it. This multi-sensory approach is very effective because students remember it in their mind and body.

The process begins with the students learning the DFYL 7 Reading & Rhythm rules to help break bad reading habits. These rules are:

Rule 1: All Words are Created Equal.

Rule 2: Relax the body and focus the mind.

Rule 3: Never repeat a word.

Rule 4: See the whole word and go to the first syllable. Use the rhythm to help you move through the rest of the word.

Rule 5: Your finger goes down the lines.

Rule 6: Read smooth, not choppy.

Rule 7: Sit up straight! Don't slouch.

The next step is called "The Pulse Beat." This is a mindfulness exercise, with students playing a simple ¼ note rhythm, with alternating hands. First focusing on the beat, and then focusing on the space in between the beat. (The space in between the beats represents the sub-conscious mind.) They are then asked to close their eyes and imagine an image of themselves excelling at reading. In this imagery they are asked to "see it and feel it."

Next, the students play the Reading & Rhythm Beat which are 1/8 notes accenting the downbeat. The accented downbeat creates an assertive rhythm, which pushes the students reading forward and the 1/8 note, which is the second hit of the rhythm, is softer and creates the flow in the rhythm, which helps students read smoothly. The students “ride the wave” as the words are riding on top of the rhythm as they read faster and faster.

Students are then led into a group read (up to 7 in a group), with the facilitator playing the Reading & Rhythm Beat on a book or a folder, to get used to hearing their voices out loud. This is followed by individual reading with the facilitator playing the Reading & Rhythm Beat, which helps students increase focus and concentration while the tempo speeds up.

Homework: They are given access to the recording of the Reading & Rhythm Beats at different tempos on a page on our website so they can use it while they read at night and after they’re done with the program. They learn the 7 rules and will sometimes have sheets from the workbook to take home to go over.

Results

Pre versus post training scores are presented in table 1 for the 293 subjects from detention camps and juvenile hall. The table shows comparison p values computed using the paired t test. Mean fluency increased from 94.5 words per minute to 146.5 words per minute (p<0.001) and the mean lack of accuracy improved from 4.5 words to 1.2 words (p<0.001).

variable	n	min	Q1	Median	Mean	Q3	max	SD	SEM	pre vs post p value
pre-fluency	293	10.0	64.0	97.0	94.5	118.0	210.0	36.6	2.14	
post-fluency	293	21.0	118.0	148.0	146.5	172.0	408.0	46.8	2.73	
change in fluency	293	4.0	35.0	48.0	52.1	65.0	281.0	27.4	1.60	
										< 0.0001

Q1=first quartile; Q3=third quartile; SEM=standard error of mean.

Table 1: Detention Camp Students Fluency (N = 293).

Table 2 shows comprehension levels for the Charles C. Cashman Elementary School in Amesbury, MA. A paired t test was used to compute p values. The pre to post change in comprehension in the 25 students in Cashman elementary school was significant as the mean increased from 22.6 (SD=8.4) to 27.2 (SD=9.8), (p < 0.001, paired t test).

variable	n	min	Q1	Mean	Median	Q3	max	SD	SEM	pre vs post p value
pre-comprehension	25	9.0	17.0	22.6	23.0	27.0	44.0	8.4	1.69	
post-comprehension	25	10.0	22.0	27.2	27.0	32.0	49.0	9.8	1.96	
change in comprehension	25	-4.0	2.0	4.7	4.0	6.0	15.0	4.4	0.88	
										< 0.0001

Table 2: Cashman Elementary Students Comprehension (N = 25).

Discussion

Low reading comprehension and fluency have been shown to be factors limiting success as adults. In fact, adults with poor reading abilities have been shown to be significantly at greater risk for unemployment, addiction, health and other risks. The Reading & Rhythm program has been developed and used in various settings to address the very poor literacy levels in students and enhance their chances for future success and health. This study attempted to demonstrate the program’s ability to remediate these shortcomings through an innovative and creative approach.

The results of this study demonstrate significant improvement in both comprehension and fluency in students who are greatly challenged by environmental and social factors. One of the cohorts were 293, 9th through 12th grade inmates of detention camps and juvenile halls. These are students forgotten and left to fail. They are considered hopeless. In the language of our Reading & Rhythm framework, we say these students have a psychological framework that is based on the Doubtful Internal Voice® creating stress, frustration, fear and the expectation of failure. Our results, that showed an increase in mean fluency from 94.5 words per minute to 146.5 words per minute is important as it demonstrates that these students are still capable of growth, learning and ultimately rehabilitation. Increasing their ability to read and their literacy skills is an encouraging first step.

These improvements can also serve as the foundation for enhancing the confidence of students who have only experienced failure. The results achieved give concrete evidence to these students that they can learn. In other words, in the language of DFYL, going from the Doubtful Internal Voice® to the “I Got This” internal voice. Students in the study reported experiencing great excitement and optimism at their accomplishments. Thus, beyond the improvements in reading fluency and comprehension, the long-term results of this program can include greater self-confidence, and a sense of hope. This positive attitude, for the first time, can support students embracing greater challenges that will foster additional growth and opportunities for success.

Finally, these encouraging results need to be followed by similar programs to expand on this success. The experience of the program in the Charles C. Cashman Public Elementary School is particularly noteworthy since the program was administered by the class teacher who was trained in the methodology. This transfer of learning to a classroom teacher indicates that this program can be scaled through a training of more teachers to use this approach in their classrooms to offer hope to many forgotten children.

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