

RESEARCH ON INTERVENTION FOR STUDENTS WITH READING DISABILITY

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Abstract: *The primary goal of this study was to examine the effectiveness of a multisensory approach to reading intervention for students with reading disability. The researcher used a quasi-experimental design in which the control and reading-intervention groups were systematically assigned. The respondents were chosen using purposive sampling. The participants in the reading intervention group achieved a significantly higher post test score on the dependent variable Word Attack and approached significance on the dependent variable Spelling. Although none of the other posttest measures were statistically significant, all posttest standard measures were higher than their matched pre test scores. In contrast, for participants in the control group, no post test scores were significantly higher while the Sight-word Efficiency post test score was significantly lower than its matched pretest score, indicating significantly poorer performance. The study had two main limitations: 1. The short duration of the reading intervention and 2. Lack of randomization of subjects.*

Keywords: Ball-Stick- Bird phonic reading system, FullerApproach, Morphology, Multisensory, Orton-Gillingham Approach.

INTRODUCTION

Reading is a skill that serves us throughout life, yet it is a skill that many people take for granted. For most children, reading is acquired effortlessly as they progress through the early school years and it serves as the primary mechanism used to acquire knowledge throughout their education. Children's literacy skills grow rapidly during the elementary school years. They begin with an understanding of the alphabetic principle of letter-sound correspondences and progress to understanding prefixes and suffixes, as they decode unfamiliar words. Children continue to refine their comprehension skills as they move from answering simple questions related to picture texts to identifying cause and effect in narrative and expository literature. As children reach the end of elementary school, they are able

to take part in oral presentations, read from nonfiction text, and "publish" their own original writing (Colony, 2010).

Reading in the adolescent years brings new demands for the reader. While adolescents have usually mastered the fundamentals of word analysis and recognition, they continue to learn about the Latin and Greek origins of words and expand their vocabularies as they become more sophisticated readers. Adolescents bring their acquired knowledge and experience to learn from the text they read and acquire new ways to learn from text. Students must be able to solve problem, read from 2 different perspectives, and reflect on and analyze reading material. Adults continue to rely on their reading skills for keeping pace with advances in their profession, staying informed of current news, and engaging in

reading for pleasure. Clearly, reading is an activity and ability that evolves throughout the lifespan. Of specific interest in our study is the adolescent reader. The relationship between adolescents and their experience with reading can be conceptualized on a continuum. On one end are adolescents who enjoy reading and do so with ease, can identify their favorite authors, and engage in reading as a leisure activity. In the middle are those teenagers who do not voluntarily read for pleasure and only engage in reading as a necessity, yet are able to read fluently and accurately. On the other extreme end of the continuum are adolescents for whom reading is a constant struggle and a frustrating experience, specifically when reading is considered an area of disability. Adolescent students arrive at this extreme end of the continuum through various routes. Typically, students with reading difficulty have struggled academically throughout school, often just barely passing each grade level. Some of these students never received good reading instruction and experienced poor environmental conditions in childhood. Some have a specific learning disability in reading, often called dyslexia. Finally, there are those students whose difficulty with reading is part of a broader learning disability; these readers are sometimes referred to as language learning disabled or garden variety poor readers. Even when a reading disability has been diagnosed early in a child's life and early intervention has been provided, the intervention may not have targeted the underlying cause of the reading deficit. Early struggles with the reading process that go unaddressed or are not successfully remediated often precipitate a negative attitude toward reading in the middle and high school years (Colony, 2010).

The study focused on students with dyslexia and students considered language learning disabled or garden variety poor readers. An individual with dyslexia or specific reading

disability is clinically defined as one who has average intelligence, does not have general learning difficulties, and whose reading problems cannot be explained by outside factors such as poor instruction, lack of opportunity to learn, sensory acuity deficits, or neurological factors. When reading is defined as the output of decoding plus linguistic comprehension, individuals with dyslexia or specific reading disability are typically those whose language skills for comprehension are intact in spite of poor word reading referred to this as the paradox of dyslexia, good (often very good) reading comprehension skills but an unexpected weakness in reading single words. However, extreme difficulty achieving basic reading skills is not exclusive to the cluster of characteristics called dyslexia. But not all reading disabilities are alike and there are those students whose difficulties manifest beyond written language and include difficulty with spoken language as well (e.g., comprehension, discourse, syntax, semantics). These students have been referred to as language learning disabled or garden variety poor readers. Regardless of the terminology used to describe the student who experiences exceptional difficulty with reading, there remains a cohort of students who have weak phonological awareness or phonological coding skills characterized by deficient word identification, word attack, spelling, and reading in general. This has been associated with a phonological core model of reading disability. Briefly stated, this means that children with reading disabilities have a poor representation in the reading centers of the brain of sound-letter correspondences. Identifying the core of the problem of reading disability is the first step to designing effective treatment. For adolescents, early identification and prevention are no longer relevant issues. The focus of attention at this stage is on reading intervention and remediation. Typically, remedial reading programs are offered

in addition to a student's regular education; they are meant to supplement the reading instruction that takes place during the school day. Multisensory instruction is one type of remedial intervention that has been used successfully with individuals of all ages.

Phonology is the study of sounds. Phonological awareness is an inclusive term that refers to all levels of awareness of the sound structure of words. Phonemic awareness is a specific term and an important aspect of phonological awareness that refers to the ability to notice, identify and manipulate phonemes. Sound-syllable association is the awareness of the sounds in the English language and their correspondence to the letters that represent the sounds. A syllable is a unit of oral or written language with one vowel sound Morphology is the study of how the smallest units of meaning are combined to form words. Structured language instruction must include the study of base words, roots, and affixes. Finally, syntax includes grammar and the mechanics of language; and semantics is concerned with the meaning of a linguistic message. Multisensory structured language programs use instructional strategies that follow core principles described as 1. simultaneous and multisensory; 2. systematic and cumulative; 3. direct; 4. diagnostic teaching to automaticity; and 5. synthetic and analytic. Simultaneous multisensory teaching employs the primary learning pathways in the brain (visual, auditory, kinesthetic, and tactile) simultaneously, to enhance memory and learning. Systematic instruction requires that instruction begin with the most basic elements of language and progress to the more complex elements. Each step builds on one previously learned and is constantly reviewed. Direct instruction means that each rule and concept is explicitly taught and not left to inference. Diagnostic teaching to automaticity refers to using instructional strategies that are

based on each student's individual needs and teaching language rules and concepts to the point of automaticity. Synthetic phonics instruction presents parts of the word and requires the student to blend the sounds into a whole; analytic phonics instruction works from the whole word and teaches how the word can be broken into its component sounds.

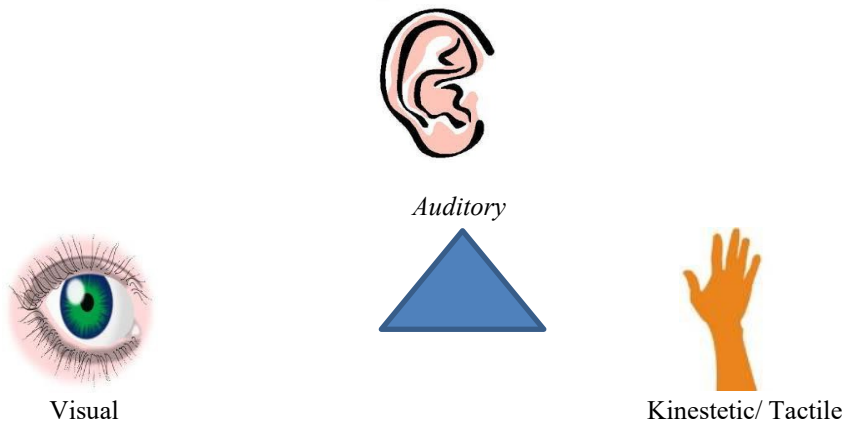
Sight words are confidence builders: The power of self-efficacy (a person's belief in his ability to accomplish a task) in learning situations cannot be underestimated. When children believe they can learn something new they are much more likely to actually acquire new knowledge. Children are smart though. They do not always believe they can complete a task just because we tell them they can. They need evidence that they have what it takes to achieve. Sight words can provide this proof for a developing reader. Because Dolch's sight words make up 50 to 75 percent of the words in any children's text knowing these lists of high frequency words gives young readers a huge advantage when attempting to read new stories. When a child sees that she recognizes more than half of the words on the page, she has the confidence to attempt to read it (Susan et al., 2014)

Sight words free up a child's energy to tackle more challenging words: Reading is a tough work. As fluent readers we often underestimate the amount of focus and energy reading takes when you do not know most of the words on the page before you. When children have to decode each word that they encounter in a sentence, they do not only become frustrated they also begin to lose the meaning of the text. They become so focused on sounding out the words that they are not able to think about what the words are actually saying. Once children know Dolch's sight words, they only need to slow down their reading to focus on decoding new, challenging words.

Sight words provide clues to the meaning of a sentence: Even though many of the Dolch sight words contain fewer than five letters, they are critical to a text’s meaning. While many pieces of children’s literature use illustrations as a companion to words, ultimately we want our young readers to be able to decipher the meaning of a text primarily by reading and understanding the words. Sight words help children make sense of what they are reading by providing clues to the

overall meaning of a sentence. Take for example a few of the verbs from Dolch’s pre-primer list: jump, play, see. The sentence “I jump in the pool” takes on a whole new meaning when one of the other two verbs are substituted. Similarly, understanding the meaning of pronouns such as I, you, she and he (all sight words on the pre-primer and primer lists) is essential to comprehending the sentences they are used in (Susan et al., 2014).

THEORETICAL FRAMEWORK



Figure

1. Theoretical Framework

This study was anchored on the Sensory Stimulation Theory of Learning its basic premise that effective learning occurs when the senses are stimulated (Laird, 1985). Laird quotes research that found that the vast majority of knowledge held by adults (75%) is learned through seeing. Hearing is the second most effective (about 13%) and the other senses-touch, smell and taste-account for 12 percent of what we know. By

stimulating the senses, especially the visual sense, learning can be enhanced. However, this theory says that if multi senses are stimulated, greater learning takes place. Stimulation through the senses is achieved through a greater variety of colors, volume levels, strong statements, facts presented visually, use a variety of techniques and media.

A Theoretical Model Regarding the Brain Circuits for Reading (Pugh, Shaywitz, Eden, Simos)

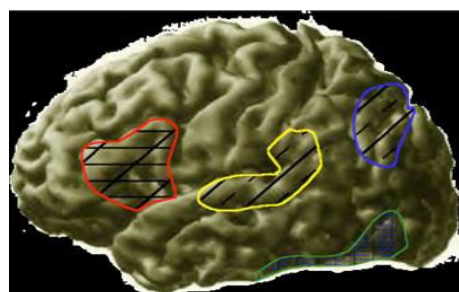
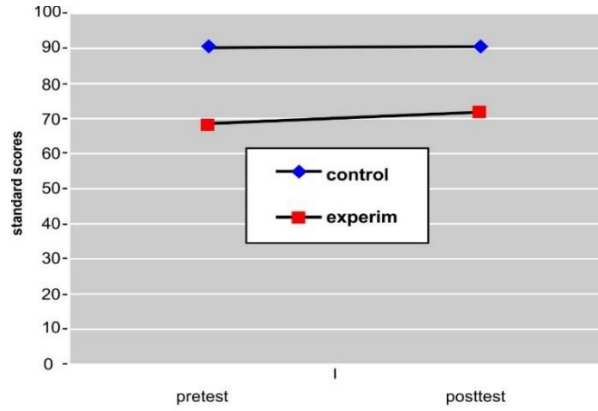


Figure 2. Theoretical Reading Model

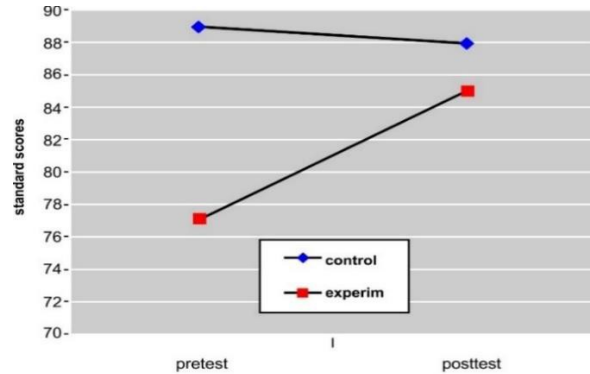
Legend:

- Wernicke's area: Phonological processing
Correspondence between letter and sound
- Angular gyrus: Relay station; Cross modality integration
- Broca's area: Phonological Processing: Articulatory mapping
- Visual Association areas: VWFA graphemic analysis



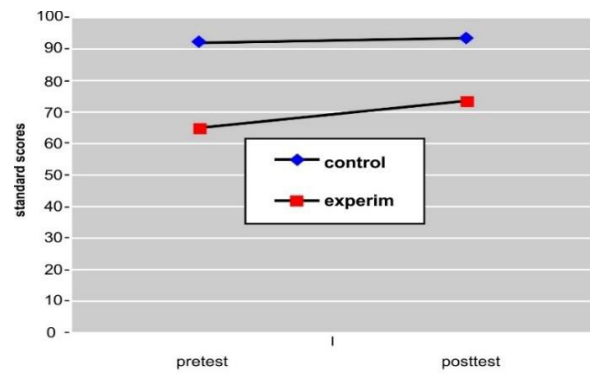
Difference in mean standard scores for *Letter-Word Id*

Figure 3 Difference in mean standard scores for Letter –Word Identification



Difference in mean standard scores for *Word Attack*.

Figure 4. Difference in mean standard scores for Word Attack.



Difference in mean standard scores for *Spelling*.

Figure 5. Difference in mean standard scores for Spelling.

Line graphs (Figures 3 to 5) illustrate the progress of the reading-intervention group in closing the gap with the control group. A common trend seen in all the figures is a relatively flat or down

ward sloping line for the control group from pretest to post test in contrast to an upward sloping line for the reading intervention group from pre test to post test

Table 1. t test for independent samples at pretest for dependent variables

Pretest	t	df	p value(significant)
At p <.05)			
WJ III Ach			
Letter-Word Id	-3.98	16	.001
Spelling	-5.32	16	.000
Word Attack	-3.44	16	.003
Sound Awareness	-2.41	16	.028
TOWRE			
Sight-word Efficacy	-3.05	16	.008
Phonemic Decoding	-3.34	16	.004
Efficiency			
All	values	were	significant to p <.05.

The t-test for independent samples (Table 3), shows that the pretest scores of the

control group were significantly better than the pretest scores of the reading-intervention group on all dependent variables at p < .05.

Table 2. Post test for Independent Variables

Source	df	F	p value (significant Adjusted at...p<.05)	Mean
WJ III Ach				
Letter-Word Id	1	.674	.425	3.605
Spelling	1	.218	.648	3.251
Word Attack	1	.402	.536	2.737
Sound Awareness	1	.153	.702	2.840
TOWRE				
Sight-word	1	.084	.776	2.759
Efficiency				
Phonemic	1	.008	9.29	.460
Decoding				
Efficiency				

Results of the ANCOVA (Table 4), which compared pretest to post test performance across

groups, revealed that there were no longer significant differences between the control group and the reading intervention group on the

dependent variables after the reading intervention. Although the post test scores of the control group were still higher than the post test scores of the reading intervention group, the difference was no

longer significant and adjusted post test scores showed that the reading intervention group improved more than the control group.

Tables 3. Reading-intervention group: t test for non-independent sample

Pretest- Posttest Pair	Mean difference from pre test to post test (negative coefficient indicates higher post test score)	Standard Deviation	t	df	p<.05)
WJ III Achievement					
Letter-Word Identification	-3.222	7.4	-1.3	9	.228
Spelling	-8.000	11.9	-2.0	9	.080
Word Attack	-7.889	3.9	-5.9	9	.000*
Sound Awareness	-8.111	17.0	-1.4	9	.191
TOWRE					
Sight-words					
Efficiency	1.222	21.5	.17	9	.869
Phonemic					
Decoding Efficiency	-2.889	10.8	-.80	9	.447

*Indicates significantly better posttest score at p <.05 level.

CONCLUSION

Based on the findings, the researcher came up with the following conclusions. When means were adjusted for pretest scores, participants in the reading-intervention group improved approximately three standard points more than the control group on Letter-Word Identification, Spelling, Word Attack, Sound Awareness, and Sight Word Efficiency. Results of a non-independent, matched samples t test, showed significant improvement for the reading-intervention group participants on the Word Attack subtest compared to the participants in the control group. In addition, improvement neared significance on Spelling for the reading

intervention group. Finally, descriptive analysis of the data revealed that on 4 of the 6 reading subskill tests, participants in the reading intervention group out-gained the participants in the control group on grade equivalent scores. The participants in the reading-intervention group achieved a significantly higher post test score on the dependent variable Word Attack and approached significance on the dependent variable Spelling. Although none of the other post test measures were statistically significant, all post test standard measures were higher than their matched pre test scores. In contrast, for participants in the control group, no post test scores were significantly higher while the Sight-word Efficiency post test score was significantly

lower than its matched pre test score, indicating significantly poorer performance. The reading intervention group made noticeable gains on closing the gap in reading skills with the reading intervention group at post test. Dependent samples t- test revealed a statistically significant improvement in Word Attack at post test for the reading intervention group and a near significant improvement in Spelling. Results of independent sample t- tests revealed that the control group had significantly higher pre test scores on all dependent variables.

Results of post test analysis using Analysis of Covariance revealed that the difference between the control group and the reading intervention group on the dependent variables was no longer statistically significant. Participants in the reading intervention group did improve their reading skills.

The three reading systems are multisensory, structured, sequential, cumulative, cognitive, and flexible. The findings were utilized by the researcher in preparing a Reading Intervention for children with reading disability.

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