

How Might Clinical Vision Therapy Improve
One Student's Reading Fluency?

A Special Project

Presented to

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FACULTY APPROVAL

How Might Clinical Vision Therapy Improve
One Student's Reading Fluency?

Approved for the Faculty

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ABSTRACT

The purpose of this project was to conduct a case study of one single student in the researcher's second grade class room. The student for the research was chosen due to being assessed significantly below average reading level upon entering second grade. The researcher had observed irregular eye movement in the student while reading that resembled symptoms of a vision deficit. The researcher had personal experience in the recognition of vision deficit symptoms in the past with the researcher's own child as well as former students. Shortly after the researcher observed the vision deficit symptoms in the student the researcher contacted the parents and recommended they seek the assistance of a professional vision provider that administers comprehensive vision exams. The student was professionally diagnosed with a vision deficit and prescribed clinical vision therapy. The researcher utilized pre and post oral reading fluency assessment data to track the student's reading progress throughout the case study. The researcher concluded that even though the student showed oral reading fluency improvement throughout the case study that there was not enough evidence to suggest the improvement was a direct result of vision therapy.

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CHAPTER 1

Introduction

Background for the Project

As a parent we all want the best for our children especially when it comes to their future. A great portion of that preparation has to do with a successful education, when one's child is not academically successful parents often turn to the child's teacher for counsel and advice to inquire what can be done to improve the student's academic situation. This special project was chosen due to personal experience. The researcher's child had struggled early on in academics, especially reading, which is the very foundation of one's education success. As the child approached fifth grade the teacher expressed great concern that the child exhibited symptoms of ADD and/or ADHD. It was suggested that the researcher seek the attention of a medical doctor for a professional diagnosis. Fearing the diagnosis of ADD or ADHD and the possibility of medicating her child the researcher postponed making a doctor's appointment and was discussing the situation with a fellow mother, who also happened to be a teacher. Having explained the situation in depth the fellow mother explained she had a similar situation with her own child and that the symptoms for ADD and ADHD often mimic a vision deficit. The researcher explained that the child's vision had been examined annually and that the child had 20/20 vision. The mother explained that most ophthalmologists

and/or optometrists rarely perform a comprehensive vision exam in which binocular dysfunction is not evaluated. The mother then referred the researcher to local optometrists that specializes in vision deficits and administers a comprehensive eye exam in which not only is distance vision evaluated but near vision function is also extensively evaluated.

Shortly after the researcher made an appointment for the child and it was discovered that the child had several vision deficits that greatly inhibited the student's ability to succeed academically. Shortly after the child's vision deficit diagnosis the child was prescribed clinical vision therapy and as a result the student's academics gradually began to improve over time.

Several years after the researcher's own child was treated for a vision deficit, the researcher was teaching elementary students and recognized the same vision deficit symptoms crop up from time to time in students in the classroom. The researcher would notice a student's irregular eye movements, rubbing of the eyes, squinting, and/or excessive blinking during reading group time, at this point the researcher discussed the symptoms observed and referred the parents to an optometrist that administers a comprehensive vision exam. This student was then diagnosed with a vision deficit, prescribed clinical vision therapy, and also gradually began to improve academically.

Statement of the Problem

Students with undetected vision deficits are struggling to achieve basic academic success due to a lack of comprehensive vision screening. Unfortunately educators as well as medical doctors are not trained to identify the symptoms of a binocular vision deficit in which near vision is negatively affected. In addition, the symptoms of a vision deficit often times mimic other disorders such as ADD or ADHD thus these students are being misdiagnosed and medicated for a disorder they may not have. To make matters worse current policy from the government level does not support the practice of a comprehensive vision screening for all students entering school.

Purpose of the Project

The purpose of the project was to conduct a case study on one student in which a vision deficit was diagnosed and clinical vision therapy was prescribed. The research conducted was to follow and collect data on how vision therapy over a three month period of time may improve the reading fluency of this one student.

Delimitations

The research conducted took place in a second grade classroom of a small private school of less than 200 students. The data was collected during the 2011/2012 school year from September 2011 to April 2012. The researcher administered bimonthly reading fluency assessments and recorded the student's

progress. The student's fluency assessments were chosen to accommodate the student's current reading level and were taken from current supplemental curriculum utilized in the researcher's instructional materials.

Assumptions

Students with untreated vision deficits have had struggle throughout their entire educational experience. These students tended to experience trouble focusing, remembering and staying on task. In addition, visually impaired students also experienced a reluctance to participate in classroom discussion and activities, exhibited low self-esteem and a negative attitude toward learning due to their struggles. Once a student participated in vision therapy their academic performance improved thus giving the student a renewed positive learning experience and therefore they were more eager to learn and attend school.

Research Question

How might the implementation of clinical vision therapy over three months improve the reading fluency of one second grade student reading below grade level?

Significance of the Project

The significance of the project was to determine if the implementation of three months of clinical vision therapy could improve the reading fluency of one

second grade student reading below grade level. If the research proves that the student reading fluency has improved in correlation with the prescribed vision therapy it would be reasonable to assume other students with diagnosed vision deficits could also find improved reading fluency with vision therapy as well.

Procedure

The following procedure was followed to conduct this research project:

1. The researcher observed a second grade student with observable irregular eye movements while reading
2. The researcher utilized a educator's vision deficits symptoms checklist to assess a suspected vision deficit
3. The researcher communicated the results of the vision deficits symptoms checklist to the student's parents and referred them to a local optometrist that administers a comprehensive vision exam
4. The researcher received communication from the student's parents that the student had been diagnosed with a vision deficit and that prescribed vision therapy would begin immediately

5. The researcher chose a specific supplemental reading fluency assessment to be administered bimonthly to the student for a three month period of time during which the student was actively receiving clinical vision therapy
6. The student's reading fluency data was collected for three months during vision therapy and then compared to the pre-therapy reading fluency data

Definition of Terms

Amblyopia. ("lazy eye"): involves lowered visual acuity (clarity of sight) in one eye which cannot be corrected by glasses or contact lenses (Optometrists Network, 2015).

Binocular Dysfunction. Any visual condition wherein binocular visual skills are inadequately developed (Optometrists Network, 2015).

Binocular Vision. Vision wherein both eyes aim simultaneously at the same visual target; vision wherein both eyes work together -- simultaneously, equally and accurately -- as a coordinated team (Optometrists Network, 2015).

Convergence Insufficiency: is a common near vision problem that interferes with the child's ability to see, read, learn, and work at near (close distances). An eye teaming problem in which the eyes have a strong tendency to drift outward or away from the target when reading or doing close work. When the eyes drift, the child might have double vision (Optometrists Network, 2015).

Strabismus. A visual defect in which the two eyes point in different directions. One eye may turn either in, out, up, or down while the other eye aims straight ahead. (Optometrists Network, 2015).

Vision. The act of perceiving visual information with the eyes, mind, and body (Optometrists Network, 2015).

Vision Deficit. “Visually impaired” refers to a medically verified visual impairment accompanied by limitations in sight that interfered with acquiring information or interaction with the environment.

Vision Therapy. Can be described as physical therapy for the visual system which includes the brain and eyes. Through a series of progressive therapeutic procedures (eye exercises), patients develop or recover normal visual skills (Optometrists Network, 2015).

Acronyms

ADD. Attention Deficit Disorder

ADHD. Attention Deficit Hyperactivity Disorder

CHAPTER 2

Review of Selected Literature

Introduction

The researcher reviewed literature from the following selected subtopics: vision and reading, vision therapy, and vision screening policy. The selected literature, interviews, and information contained on websites contributed to the researcher's understanding of how clinical vision therapy could potentially benefit a below grade level student in the area of reading fluency.

Vision and Reading

With the rise of Common Core Curriculum and high stakes testing, it is increasingly evident that an increased emphasis on reading will continue into the future of education. Now, students are expected to know more than ever when entering kindergarten as well as upon completing kindergarten (Guidry, 2015). With the importance of reading early in one's educational experience, one cannot afford to have a missing link. Reading has become increasingly text-based in the everyday classroom. As a result, students are expected to read a larger variety of text-based materials which may include small, medium and large print text in books and worksheets than similar students had read in the past. In addition, with an increased amount of technology in the classroom one's near vision is utilized

when reading from a computer and tablet screen, all of which require healthy near vision to read things up close (Pennsylvania Optometric Association, 2011).

The development of healthy vision is the foundation of one's reading ability in life and evolves over time from birth and throughout one's life. According to author's Piquette & Boulet (2013, p.203), vision function is progressive and dependent on sensory skills that aid memory and other executive functions involved in reading. Vision enlists a feed-forward type of relationship in which cognitive planning and execution support the advancement one another (Piquette & Boulet, 2013, p.203). Without healthy vision it would be very difficult for a student to be successful in our society, which is based on visual skills at a very young age. By mid-elementary, students are expected to have the ability to visually acquire and process the images that make up printed text. As a result, students with undetected visual dysfunction are at a significant disadvantage compared to peers with healthy vision function (Piquette & Boulet, 2013, p.203).

Proper eye teaming, one's two eyes working together to focus, is an essential element in learning to read. The eyes must be in working order and synchronized to achieve optimal reading ability, especially since so very much of reading is dependent upon being able to acquire and process a variety of texts in the classroom and beyond. Americorps Child Vision Project (2010) found that in

two California School Districts 40% of the 3721 students participating in their study experienced a variety of discomfort while reading and/or focusing on text. These symptoms ranged from wiggling words, or words that come in or out of focus while reading. Students that experience a variety of vision deficits have trouble reading and often exhibit undetected symptoms such as red, sore, and/or itchy eyes, observable jerky eye movements, and eye rubbing. The Americorps Child Vision Project also noted that symptoms such as wiggling words and words that come in and out of focus have been found to directly correlate to low reading fluency scores (2010). When a student is focused on reading, both eyes should be looking at a specific word at the same time, as is illustrated in figure 1 in the diagram on the left.

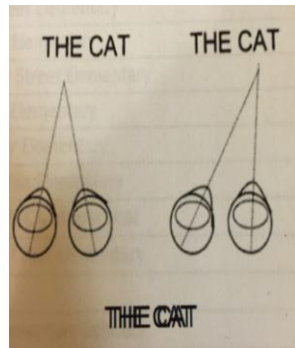


Figure 1. The Gemstone Foundation

In this diagram, the angled movement of both eyes is the same angle with the right eye directed left and the left eye directed right. The diagram on the right demonstrates what one sees when eyes cannot coordinate, or team together. It is clear the eyes are not synchronized with the left eye pointed at a sharp angle as

the right eye has little angled movement. As a result of the eyes not working together effectively, the student sees the words in front of them blur or double. Therefore, students who experience binocular coordination problems have difficulty reading, especially smooth swift fluent reading.

At this present time and juncture in the field of education, educators are largely unaware what to look for in their students to recognize a potential vision deficit. Normally, children are willing to voice to an adult a discomfort or abnormality of some sort in regards to their well-being. However, students born with a vision deficit may not have awareness that their vision is compromised or not functioning properly because it is how they have always seen things (Prevent Blindness Georgia, 2015). As a result, these students are unable to recognize and report the dysfunction. If teachers were trained to identify key symptoms that impede ones near vision, more students could seek a vision-altering intervention.

Vision deficits often go undetected due to the ignorance of educators as well as parents. If a student struggles in reading it would only be logical to discover what it is that has created the barrier to student success and address it as soon as possible. The Optometric Extension Program Foundation (2011) suggests that teachers are the best screeners of vision deficits in children due to the amount of time spent with their students in the classroom as well as their observations of the student's functioning in the classroom environment.

In an effort to help recognize students with near vision deficits, it is important to educate and equip educators as well as parents, with the necessary information to identify possible symptoms of possible vision problems. (Optometric Extension Program Foundation, Inc., 2011) A comprehensive educator's checklist of vision deficit symptoms and what should be looked for would be helpful to educators and parents alike (see Appendix A).

Vision Therapy

In the event that a student is properly diagnosed with a vision deficit, a licensed ophthalmologist or optometrist may prescribe vision therapy in order to enhance visual performance. As with any other medical diagnosis and therapies, each person is prescribed a specified treatment that is tailored to their individual needs. Clinical vision therapy is administered in a doctor's office and is not a self-help vision improvement program that one purchases with a promise of throwing away one's corrective lenses. Clinical vision therapy is endorsed by the American Optometric Association and by other professional eye care organizations and does not make claims to reverse one's vision deficit. Prescribed clinical vision therapy has been found to correct or improve the following vision deficits: Amblyopia, often times referred to as "lazy eye," Strabismus, and other binocular vision problems (Heiting, 2014). The regimen can be prescribed for as little as two

months. However, it can continue for a year or more depending on one's specific need (Washington State University, 2013).

Clinical, prescribed vision therapy is a doctor supervised, non-surgical, and customized program of vision exercises, or activities designed to improve, and sometimes correct, a variety of diagnosed vision problems (Heiting, 2014). Unlike corrective lenses, such as eyeglasses or contact lenses, vision therapy targets training the visual system to improve itself and is likened to physical therapy for one's eyes. Because vision therapy is an individualized vision improvement program, it is important to realize it cannot be defined by a simple list of tools or techniques. Therapy session activities range from in-office reinforcement exercises such as, tracking a moving ball (see Appendix B) or using tweezers to put rice down the hole of a drinking straw, to specialized lenses referred to as "training glasses", prisms, filters, patches, electronic targets, or balance boards. Vision therapy, like other therapies, is not exclusive to one specific type; there are in fact three main categories of vision therapy with each targeting a different vision deficit: orthoptic vision therapy, behavioral/perceptual vision therapy, and vision therapy for prevention of myopia. The overall goal of the vision therapy is to use a series of prescribed eye muscle activities in order to strengthen eye muscles around the eye to improve the alignment and focus of the eyes (C. Manley, personal communication, March 18, 2015).

Orthoptic vision therapy is typically utilized with children and designed to improve binocular, or near vision focusing. Orthoptic vision therapy provides the patient with in-office visits under the supervision of a trained therapist; the visits consist of prescribed eye exercises followed by assigned eye exercises to be performed at home. The two remaining forms of vision therapy are: behavioral/perceptual vision therapy and vision therapy for prevention or correction of myopia. Behavioral therapy is utilized when one's visual processing and perception is affected and thus focuses on exercises that improve the skills involving visual processing and perception. Nearsightedness utilizes a specific vision therapy for the correction and prevention of myopia as well as utilizing bifocal eye glasses.

While some remain skeptical, recent scientific research has brought the effectiveness of clinical vision therapy to the forefront of the field of vision deficits (Mozlin, 2010). Previously, the majority of scientific research regarding vision therapy effectiveness had been limited to case studies. Recent research conducted has involved treatment and control groups. One such example includes a study by Dr. Mitchell Scheiman, according to a statement released by the National Eye Institute (2015);

Dr. Mitchell Scheiman, FCOVD, (2008) has completed the 12-week study, known as the Convergence Insufficiency Treatment Trial (CITT),

found that approximately 75 percent of those who received in-office therapy by a symptoms related to reading and other near work after the office-based vision therapy.

Vision Screening Policy

Currently it is estimated that 25% of school aged children suffer from some sort of undetected vision deficit. (National Commission on Visual Health, n.d.). This high percentage is due to how the United States performs vision screenings in children, if they do them at all. According to the American Association for Pediatric Ophthalmology and Strabismus organization (2015) nine states do not require vision screening of any kind for children prior to school or anytime during the student's school years. In the United States 39 states require vision screening. However, they do not necessarily require children that fail the screening to follow-up with an eye care professional.

In addition to the lack of vision screening requirements and follow-up, most screenings are inadequate to assess both distance and near vision abilities (Zaba, 2011, p.40). Current screening methods are generally inadequate because they rely on a Snellen chart, an archaic vision assessment tool that assesses one's ability to see from a distance not what one's ability to see near.

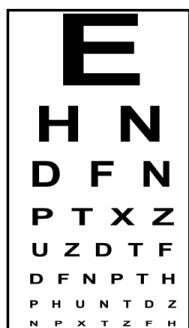


Figure 2. Snellen Chart (Google Images)

This 150-year-old test is the sole factor in evaluating one's ability to see in the classroom and only assesses distance vision. Utilizing this chart may indicate 20/20 vision however, it doesn't assess one's ability to see and focus on what is seen near. When students are screened using the Snellen chart, the assessment only assesses whether a child can see a 3/8" high letter or picture from a distance of 20'. While this may be ideal for assessing whether a student can see a chalkboard from the back of a classroom, it lacks an assessment of one's ability to see text up close. Currently a Snellen chart vision screening is the standard that educators and parents rely on to assess a child's vision health. (S. Candanoza, personal communication, March 18, 2015) According to Dr. Mary Pellicer a physician in Yakima, Washington, it is time to "identify the needs of children and assure their safety and well-being, to become aware of this overlooked problem of binocular dysfunction in our children." (M. Pellicer, personal communication, July 25, 2013).

Although detection and treatment of vision disorders could have a dramatic impact on student achievement and success, education law does not typically focus on physical well-being as a means to improve education. Despite the fact that the state of Washington law RCW 28A.150.200 states that it is the responsibility of the State to provide ample provision for the education of all children within its borders (Washington State Legislature, 2015), the State falls short when it comes to recognizing the correlation between healthy vision and student success. The law does not require routine vision screening prior to school admittance. However, it does require screenings in kindergarten, as well as grades one, two, three, and five. Even though the state requires initial early elementary vision screenings, these screenings are a far cry from what is considered a comprehensive vision screening that would include assessing binocular, or near, vision. (Obena, 2013, p.7) In order to assess one's near vision, a proper screening would need to assess one's ability to track proficiently (eye movement control), eye teaming ability, focus near-to-far, sustain near focus, depth perception, and visual memory.

Washington State law RCW 28A.210.020 gives individual school boards the power to make provisions to visually screen children as well as in accordance with the procedures and standards that have been adopted by the State Board of Health (Washington State Legislature, 2015). Unfortunately, the State Board of

Health will only permit the Snellen chart vision screening or other screening procedures equivalent to the Snellen test if they have been approved by the State Board of Health. Should the Board of Health wish to adopt another form of vision screening, it would need to seek recommendations from OSPI in regards to the administration of a new vision assessment and as to who is qualified to administer such an assessment (C. Hardison, personal communication, March 26 2015). It is unknown if the two state organizations have come together to discuss the issue. However, one would be left to assume that, since nothing in the law has changed in regards to routine administration of Snellen chart vision screenings, there is ultimately a disconnect between the two state organizations creating a barrier for students with undetected vision deficits (Hardison, 2014).

Obena (2013, p.16) explains that a multi-level approach in addressing children with vision problems includes an educator level in which it would give teachers autonomy as well as a responsibility to assist in detecting vision problems. In addition, Obena also refers to a school-based level in which schools would be utilized as distribution centers to reach parents via presentations and hard copy information. This multi-level approach would then serve as the framework in the designing, as well as the implementation of future vision deficit detection activities and goals. Some of the proactive steps that would need to take place include: regular comprehensive screening of a child's vision through their

school years, educating parents as to the importance of getting their children screened, and what to look for in a comprehensive screening.

This multi-level approach would make it necessary to bridge the gap with the education and medical communities alike in an effort to help children receive proper vision screening (K. Campbell, personal communication, January 31, 2013). This endeavor will require collaboration between business, education, government, health, and the non-profit sector to assist with providing the necessary care to children whose parents are not able to afford vision exams, glasses, and/or vision therapy. Lastly, it will be beneficial to all involved to collaborate with one another in an effort to make proper vision screening and care a priority for all children. (Wolinski, 2014)

Summary

Students or children often experience vision deficits. Vision deficits are difficult to identify because children don't usually know if their vision is compromised as this is how they have always seen the world around them. Unfortunately, these undetected vision problems can put a child's educational foundation in jeopardy because a student's ability to obtain reading fluency can be negatively affected.

Many of these students could be helped if educators and parents were informed of the signs to look for in their children. Educators and parents need to be educated on how to look for possible signs that a child's vision may be compromised and where to seek proper help for a diagnosis.

Once a proper diagnosis is given, physician-prescribed, clinical vision therapy may be a positive course of action for an improvement or, in some cases, a cure. Vision therapy is comprised of both in-office and at home vision exercises that strengthen and train the eye muscles. When trained and strengthened, vision and the ability to focus properly increase one's ability to focus on what is seen up close in a text. Although vision therapy isn't a guarantee of one's success academically, the research suggests it is effective in the improvement of reading.

Unfortunately, many children go undiagnosed and suffer needlessly because of policy, both on the federal and state levels. Schools are required by law to utilize inadequate vision screenings, if vision screens are even required. It will take the collaboration of governmental, medical, educational and parent communities to provide children who have vision deficits the help they need to succeed in their academic endeavors.

CHAPTER 3

Methodology and Treatment of Data

Introduction

The researcher identified a student who displayed signs of a vision deficit, referred the student for professional testing, and documented the student's performance before, during, and after prescribed vision therapy. The student was clinically diagnosed with a vision impairment that affected her ability to read and learn. The prescribed treatment was to enroll the student in weekly vision therapy to correct the impairment and increase her ability to read. The student had been undergoing bi-monthly reading assessments that gauge fluency; the assessments observed had been recorded pre and post vision therapy intervention.

Methodology

The researcher's study is a case study that draws on a mixture of qualitative and quantitative research. The qualitative research conducted utilized what the researcher observed in one below grade level second grade student during weekly reading group time. The researcher used personal observation of the student's irregular eye movements while reading and recommended the parents seek further evaluation with an eye care professional. The case study focused a real life problem experienced by many educators and students alike; students struggling in reading. The researcher focused on the student and explored

the possible effects of an unconventional treatment, vision therapy, as a possible solution to improving the student's reading fluency.

The research was quantitative in that the researcher utilized the student's bimonthly fluency assessment which assessed the words read per minute pre and post vision therapy intervention. These scores were then compared and analyzed to determine if there was any correlation between the vision therapy and improved reading fluency in the student. The researcher also utilized MAPS standardized testing scores that were administered three times throughout the research period to analyze further the student's reading progress throughout the time period.

Participants

The case study was conducted in a small private school located in Kennewick, Washington. The project setting took place in a second grade classroom of 13 students; of the 13 students 15% were Hispanic, 8% African American, and 77% Caucasian. The participant was new to the private school and had previously attended first grade in the public education sector. It was the wish of the student's parents to enroll their child in a smaller classroom size setting.

The participant was chosen based on what the researcher had observed within the first two weeks of the academic school year of 2011/2012. Within the first two days of the school year the student was given a pre-assessment in the area of reading to assess the student's reading ability, the results indicated the student was below grade level in the content area of reading. After the researcher

assessed the student's reading level the researcher chose to not include the student in a reading group and to conduct one-on-one teacher/student reading instruction.

Upon working with the student one-on-one the researcher observed irregular eye movements that were similar to what the researcher had observed in the researcher's own child and former students with diagnosed vision deficits. The irregular eye movements observed in the student consisted of the pupil of one eye drifting from focus while reading, see figure 3. In addition, the student exhibited other symptoms such as rubbing of the eyes and excessive blinking.

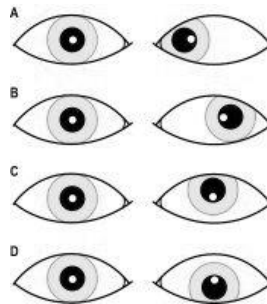


Figure 3. <http://www.medical->

[dictionary.thefreedictionary.com](http://www.medical-dictionary.thefreedictionary.com)

In an effort to set an assessment routine that the student was accustomed to, reading fluency assessments were administered bi-monthly; typically on a Friday, except when there was no school. In such event the assessments were given on an alternate weekday.

The student was chosen due to a below average reading assessment score resulting from a reading assessment given within the first two days of school. In

addition, the researcher noticed the student's irregular eye movements while reading.

Within the first week of one-on-one reading instruction the researcher observed the irregular eye movements in the student while reading; this experience seemed to mimic the researcher's own child's experience in the past. The researcher then spoke with the student's parents and advised them to seek the advice of a professional in regards to a comprehensive eye exam. The parents followed through with getting a comprehensive eye exam and the student was diagnosed with a vision deficit and clinical vision therapy was prescribed. The student began therapy soon after the diagnosis as soon as the parents were able to secure funding for the treatment.

Instruments

In this case study the researcher utilized Lakeshore Building Fluency Card Bank grades 1-3 (see Appendix B) as a supplemental fluency assessment. The curriculum was not a part of the regular curriculum but a supplement for students in the classroom to build and strengthen fluency. The researcher administered the first four assessments prior to the student's vision deficit diagnoses and continued to utilize the assessment throughout the student's prescribed vision therapy. All of the student's assessment took place during regular class time and prior to lunch, assessments were given two times a month trying to adhere to an every other Friday schedule when possible. The initial fluency assessment was administered

in late September of 2011 followed by bimonthly assessments throughout the academic school year through March of 2012. Four assessments were given pre-vision therapy to create somewhat of a baseline to the post-therapy assessments.

The assessments conducted consisted of one page of reading text from the Lakeshore Building Fluency Card Bank grades 1-3. The student was to read aloud as much of the text as quickly and accurately as possible within one minute. The text utilized consisted of a larger font and greater line spacing as suggested by the vision therapist via parent/teacher communication. The researcher documented the student's progress with each assessment administered.

The researcher also collected reading data from the MAPS standardized test. MAPS assessment took place three times during the academic school year, the first assessment was held in the fall of 2011, the second was administered in winter of 2012, and the final assessment in the spring of 2012.

The design also included a brief interview with the student and the parent to discuss the student's overall attitude toward reading both prior and post vision therapy intervention.

Design

The assessments were designed to investigate the improvement, if any, of the student's reading fluency pre and post vision therapy. The assessments given were not necessarily created to be utilized as an assessment but as a supplemental independent activity in which a student would be self-directed to complete the

fluency activity. The supplemental curriculum was not designed exclusively for reading fluency but also implemented practice with intonation, expression, pacing and comprehending fiction and non-fiction. Although the supplemental curriculum targeted reading skills beyond fluency the researcher limited the bi-monthly assessments to the progression of the student's fluency throughout the study.

The researcher also utilized the student's MAPS standardized tests scores to assess reading progress. This assessment was given three times a year, in the fall, winter, and spring. The MAPS assessment provided information to identify the student's academic reading placement utilizing a specific score (see Appendix C). The assessment informs the educator and parents of the student's current grade level reading placement based on the assessments taken and measures the progress made throughout the school year.

Procedure

The researcher administered routine fluency assessments on a bi-monthly basis to the student; these assessments began prior to vision therapy and continued to be administered throughout the school year. The researcher strived to give assessments every other Friday with the occasional exception of no school days and or holidays during the duration of the study. The student was given a one page text, with larger than usual print, the text also had the word count at the end of each line (see Appendix B). The student was given one minute to read as much

text as possible as well as accurately as possible. As the minute assessment commenced the researcher recorded the results. The results were recorded on a student specific log sheet to observe the overall reading fluency progress over the time of the study.

The researcher then took all the assessment data and created various graphs to assess and compare the student's progress pre and post therapy.

Treatment of the Data

After the researcher recommended the student to be further evaluated by a vision professional and was diagnosed with a vision deficit the researcher asked the parents' permission include the student in a case study regarding the affects on reading when the student is undergoing vision therapy.

The researcher collected bimonthly reading fluency assessment data by administering the Lakeshore Learning Building Fluency Card Bank activity. The researcher also utilized the MAPS standardized testing to monitor the student's reading progress throughout the duration of research. All data collected was a regular part of the researcher's beginning of the school year routine and ongoing progress monitoring the student's reading level. This collection of data was collected both pre and post vision therapy intervention. The researcher then organized the assessment data in a variety of graphs to analyze the overall results. The data collected then compared the pre-intervention assessment data to the post-intervention data. The researcher also compared the student's results against

the average second grade student. Upon completion of the data graphs the researcher described the results of each graph in narrative form to explain the findings. The final data analysis was used to determine if vision therapy had any correlation to the overall reading progress of the student.

The researcher also conducted a post vision therapy interview of the student and parent to collect data on the student's overall attitude toward reading pre and post intervention. This data was reflected in a narrative form by the researcher.

Summary

Chapter three was designed to review the methodology and treatment of data the researcher collected over a period of time spent observing and documenting student reading fluency progress in a student undergoing vision therapy. The researcher collected and documented reading fluency assessment data for one student with a clinically diagnosed vision deficit. The data collected was pre and post vision therapy that had been prescribed via an optometrist chosen by the student's parents.

CHAPTER 4

Analysis of the Data

Introduction

The researcher conducted a case study to examine the effects of vision therapy on a second grade, below-average student in the content area of reading. The researcher designed the study to inquire of the student's progress in the area of reading fluency before, during and after clinical vision therapy. The study was conducted in a second grade classroom in small private school in Kennewick, Washington. The assessment data of the case study was intended to decide if prescribed clinical vision therapy contributed to the reading fluency progress of the second grade student.

Description of the Environment

The subject of this case study was an eight-year-old student in a second grade classroom of a small private school in Kennewick, Washington. The class consisted of a total of 13 students: four males and nine females. The classroom demographics included 77% Caucasian, 15% Hispanic, and 8% African American. The student chosen for this study was a Caucasian student from a lower middle income home and a portion of the student's school tuition was provided for by a scholarship granted by the school due to financial hardship. The hardship was determined by the parents completing a scholarship application that was presented to the school's board of directors for approval.

The research took place during the 2011 – 2012 academic school year, and began in late September 2011 and continued through the end of March of 2012. The researcher made a regular practice at the beginning of each school year of assessing student reading abilities within the first two days of school for the purpose of determining reading group placement of students. During the reading group placement assessment, the researcher identified that the student was below grade level. Reading groups were established by the end of the first week of school and organized according to reading ability. It was determined that because of the student's below grade level reading ability that the student would not be in a reading group with other students, but receive one-on-one reading instruction. By week two of the school year the student began meeting once a day for a minimum of 20 minutes Monday thru Friday independently with the researcher for reading instruction. It was during this week that the researcher observed the student's irregular eye movements when reading.

Research Question

How might the implementation of clinical vision therapy over three months improve the reading fluency of one second grade student reading below grade level?

Results of the Study

The researcher utilized the following graphs to analyze the data that contributed to the results of this study. The first graph, figure 4, was constructed

to compare the average words per minute read for the average second grade student (Hasbrouck & Tindal, 2006) as compared to the research student prior to vision therapy intervention. The average second grade student is expected to have an average +1.2 words read per minute growth each week throughout the school year. However, the student used in the research had a -5.4 average loss of words read per minute growth prior to the vision therapy intervention.

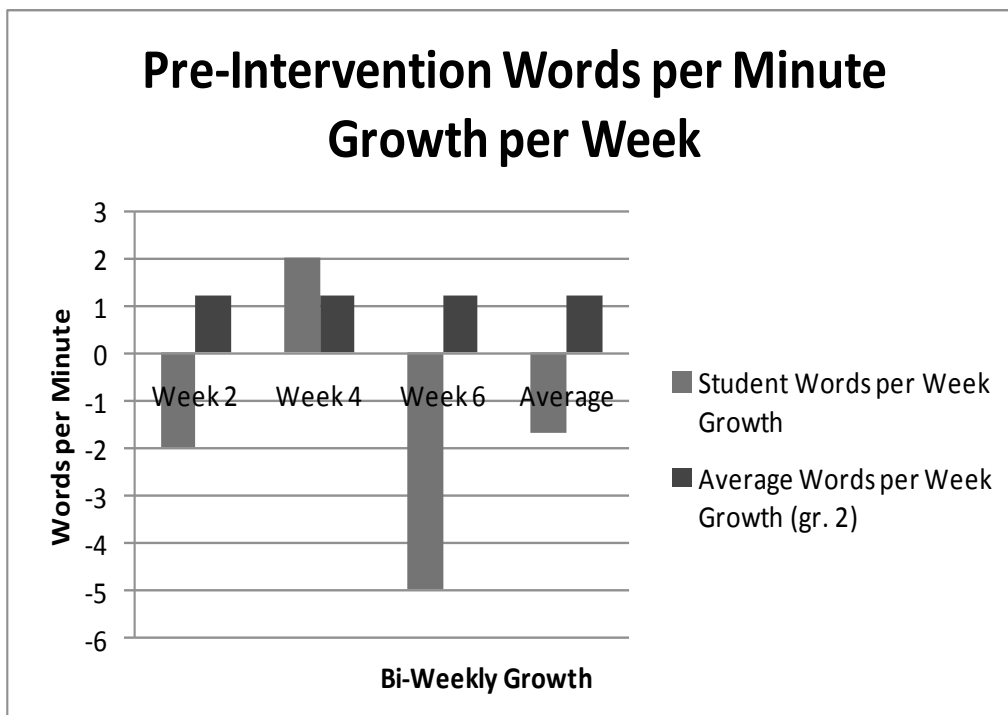


Figure 4

In figure 5, the data reflects the research student's words per minute growth post vision therapy intervention as compared to the average second grade student. The student had an average growth of +3 additional words per minute

read each assessment post vision therapy. Week 18 shows a loss of growth at -1.

The researcher is unsure why the student did not show growth that week.

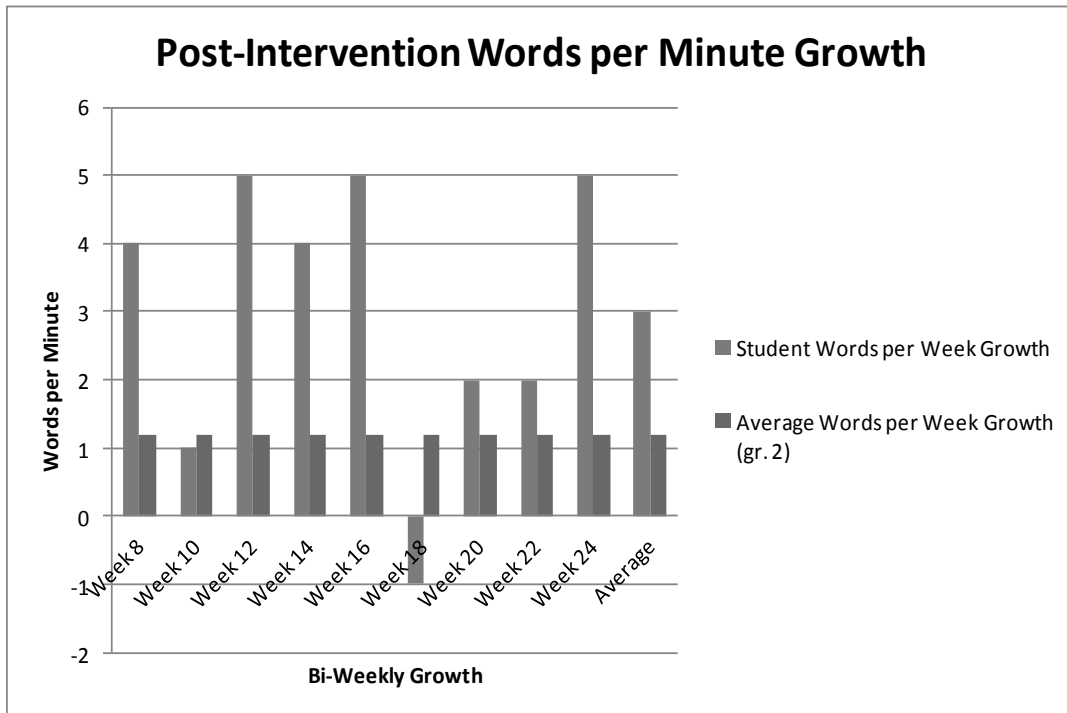


Figure 5

Figure 6 compares the overall growth of the research student's words read per minute pre and post vision therapy intervention for the duration of the study as compared to that of average second grade student. The graph shows that the research student made gains of an average of +3 words per minute for every assessment given bimonthly during the time of the prescribed vision therapy. This +3 gain would calculate to an average weekly growth of +1.5 words per minute which is slightly higher than that of the average second grade student.

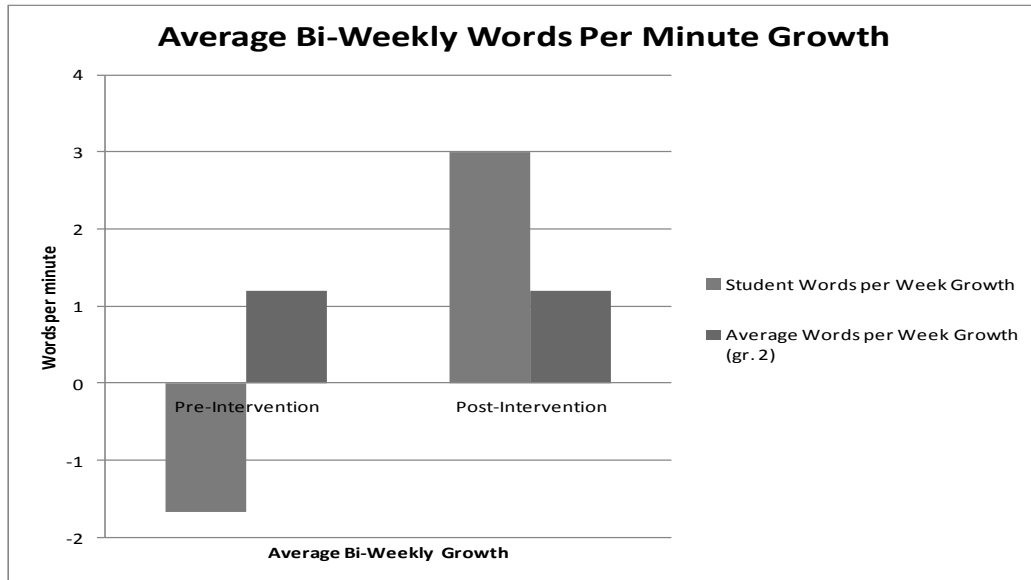


Figure 6

Figure 7 is a bar graph of the research student's bi-weekly oral fluency assessments pre-vision therapy intervention. This graph shows the words per minute read by the student for the particular reading assessment given. This graph shows that the student was 36 words below the words per minute read by the average second grade student. It is evident that there was some growth from assessment two to assessment three, but there was a loss of growth in assessment four. This table shows that the student had inconsistent growth in words read per minute prior to vision therapy.

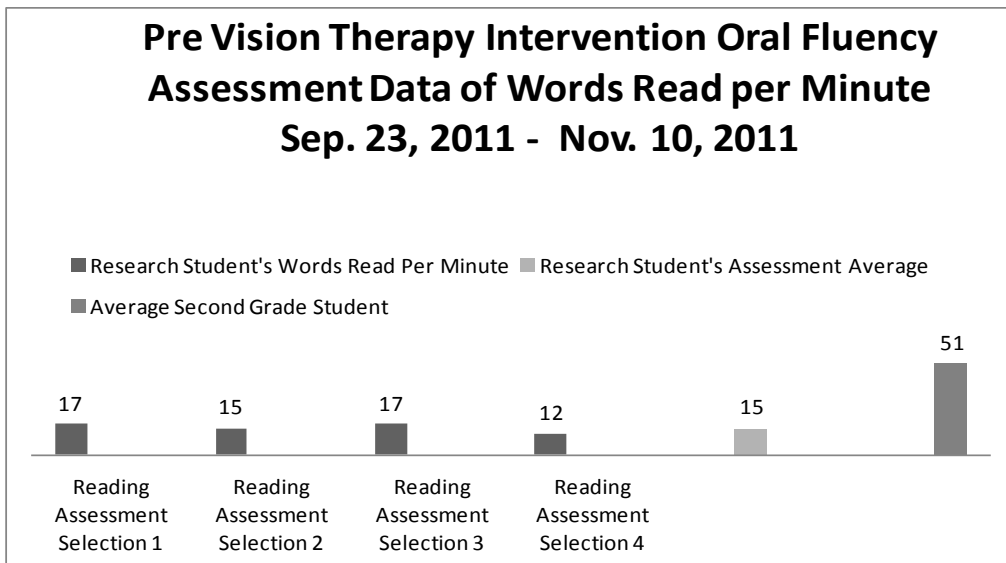


Figure 7

Figure 8 is a graph displaying the student's assessment progress while undergoing vision therapy. The graph depicts a steady growth throughout the student's assessments with the exception of the tenth assessment in which the student loss growth by one word per minute from the previous assessment. By the end of the case study the student had average 27 words read per minute which was 12 words per minute growth for the duration of the study.

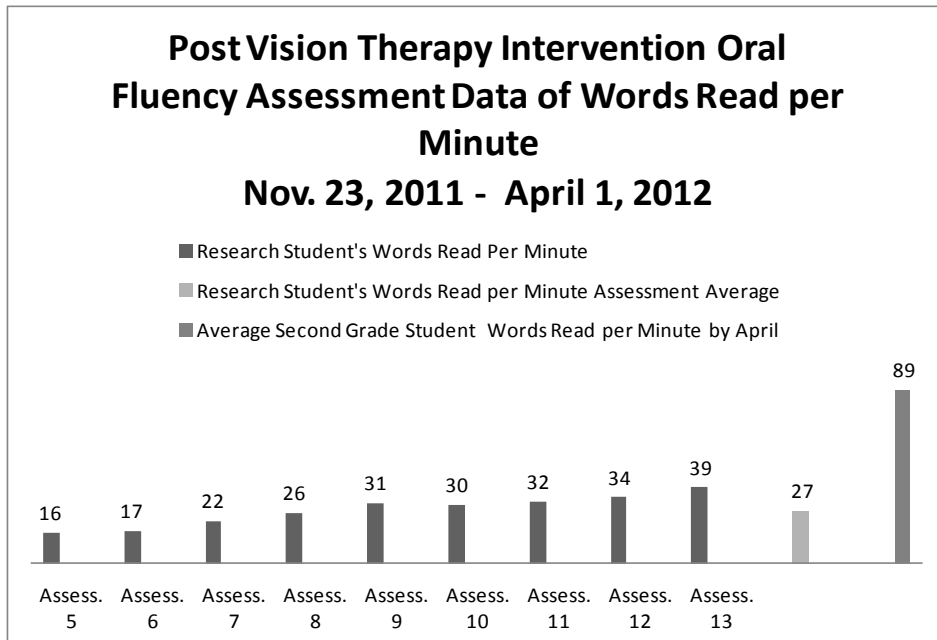


Figure 8

The MAPS assessment data in figure 9 compares the research student's MAPS scores to the average second grade student (NWEA. 2012). For the initial fall assessment the research student received a score of 156. The student's score is 20 points below the average second grade student score. The student's winter assessment was a 152 and dropped -4 points below the student's original score of 156. The student made growth for the final MAPS assessment going from a 152 to a score of 164 and made a total +8 point growth in the reading score.

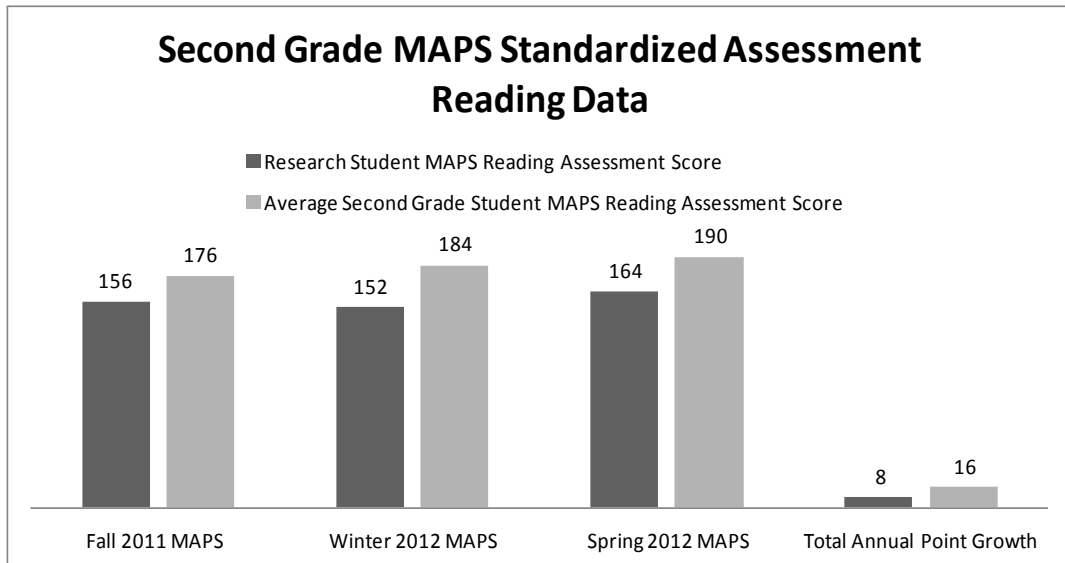


Figure 9

Findings

The researcher found that the student had an overall improvement of 80% words read per minute increase over the course of vision therapy and almost doubled the words read per minute by the end of the case study.

Discussion

The student assessment results supported what the researcher had expected. The student built a considerable amount of growth after the implementation of prescribed vision therapy. The student started out considerably below average in the area of reading fluency and nearly doubled the words per minute read by the end of the study.

Although the student's reading fluency improved as the researcher had anticipated, the ultimate findings were proven to be inconclusive due to several factors in the research environment and beyond.

It could be argued that the smaller class size and individualized instruction could have been a contributing factor to the student's overall success. A typical Washington state classroom has 20+ students (Office of Superintendent of Public Instruction, 2013. P. 55). The research environment for this case study consisted of a classroom of only 13 students. Because of the smaller class size, the researcher had the ability to give one-on-one reading instruction which may have contributed to the student's improved reading fluency regardless of the vision therapy intervention.

One could also argue that the daily 20 minute reading five days a week could have had a positive effect on the overall success of the student's progress in reading fluency. Based on the researcher's past experiences with the researcher's own children and previous students that came from a public school background, it is unusual for a student to engage in 20-minute reading groups five days a week.

Another topic of discussion could be the daily parental involvement in the student's reading homework. Because the research environment was a private school of so-called paying customers, educators generally find a more invested parent population. In addition, the researcher had the ability to connect with parents on a regular basis. Here, the researcher assigned daily reading homework

to be completed with the parents at home. The parents were responsible for listening to the student read to them, followed by initialing the student's completed reading assignment. This instilled accountability on the parent's part as well as the student. In the event that the student missed a day of reading homework, the researcher was able to personally connect with the parents to discuss why the homework had not been done or question if the parents had forgotten to initial the assignment upon completion. This process for student and parental responsibility could have also contributed to the overall student reading success in that the parents were also accountable to see that reading homework was completed so that it did not reflect negatively on the parents.

A final topic for discussion could be the reading curriculum. One could contend that the heavily phonics-based curriculum used in the research environment was more beneficial than the student's previous guided reading instruction. The student had previously attended a school where guided reading instruction was the foundation of the student's reading education. The student could have lacked overall phonetic awareness and once introduced, thrived on the new approach to reading.

If the researcher were to conduct further research it would be beneficial to expand the research to a classroom, or various classrooms of 20 or more students where it may not be possible for the reading instruction to be one-on-one for students with diagnosed vision deficits. It may be necessary to establish two

groups of subjects with diagnosed vision deficits: one group that is actively undergoing vision therapy, and another group that is not receiving vision therapy. Both groups would receive the same reading instruction and assessment protocol to determine a possible correlation between reading fluency progress in subjects with diagnosed vision deficits that undergo vision therapy.

In the event of further research, the researcher would also extend the data instruments used to include assessment data on reading errors, voice intonation, and comprehension.

Summary

The researcher set out to discover if reading fluency of a below grade level second grade student diagnosed with a vision deficit would improve while undergoing prescribed clinical vision therapy. The student was given pre-intervention bimonthly reading fluency assessments and continued with the same form of assessment throughout the student's vision therapy intervention.

The researcher found that the student's overall fluency in words read per minute almost doubled by the end of 12 weeks prescribed clinical vision therapy. The student also had consistent words read per minute gains from assessment to assessment. However, the researcher concluded that there was no definitive correlation that would suggest the student's reading fluency gains were a result of undergoing vision therapy. The gains could have been positively affected due to the research environment that involved smaller class size; the researcher's ability

to provide a mixture of individualized and independent reading instruction; greater parental involvement; and/or a change of reading curriculum more conducive to the student's learning style.

CHAPTER 5

Summary, Conclusions, and Recommendations

Introduction

The researcher set out to investigate whether a second grade student that was below grade level in reading with a diagnosed vision deficit would improve in the area of reading fluency as a result of clinical vision therapy. Recent research has suggested that clinical vision therapy is academically beneficial to children with a vision deficit diagnosis, particularly in the area of reading. The case study followed one student's experience in the researcher's classroom in which the student's reading fluency data was collected both prior to and during the vision therapy intervention. The researcher then analyzed the data collected to investigate the growth in the student's reading fluency.

Summary

This case study took place in the researcher's second grade classroom in a small private school located in Kennewick, Washington. The researcher's class had a total of 13 students enrolled. The researcher, due to personal past experience with vision deficits noticed the student exhibited symptoms of a vision problem and referred the student's parents to seek a comprehensive vision exam. The student was found to have a vision deficit and prescribed vision therapy. The

researcher had collected reading fluency data from the beginning of the school year, as well as during the vision therapy intervention, that data was then analyzed and compared to the per-intervention reading fluency data.

Conclusions

The case study spanned over a time of three months after diagnosis in which the researcher collected reading fluency assessment data on one student that was undergoing prescribed clinical vision therapy. Prior to the case study the student was reading an average of 15 words per minute, at the end of the case study the student was reading an average of 27 words per minute with an overall 80 percent increase in words per minute.

Although the student's average words per minute remained below grade level by the end of the case study, the overall increase in words per minute is promising for the student's future reading fluency growth. Had it not been for the researcher's prior personal experience with recognizing symptoms of a vision deficit the student's vision deficit may have went undetected and the student would continue to struggle in the endeavor to read.

Recommendations

The case study found that if educators and parents are informed and educated on what to look for in the symptoms of vision deficits more students

could be assisted in locating comprehensive vision exams. Comprehensive vision exams administered in the early years of a child's education is key to detecting vision deficits early on. Once properly diagnosed vision therapy may be prescribed for a time period to either correct or improve the vision problem. As a result students that have been struggling with their vision will be able to see things correctly and thus their academic future may improve over time.

REFERENCES

- [Eye diagram]. (2015). Retrieved from <http://www.medical-dictionary.thefreedictionary.com>
- American Association for Pediatric Ophthalmology and Strabismus. (2015, April). Vision Therapy ? AAPOS. Retrieved from <http://www.aapos.org/terms/conditions/108>
- American Association for Pediatric Ophthalmology and Strabismus. (n.d.). State-by-state vision screening requirements ? AAPOS. Retrieved April 2015, from http://www.aapos.org/resources/state_by_state_vision_screening_requirements
- Americorps. (2010). Child Vision Project. Retrieved March 2015, from <https://childvisionproject.wordpress.com/>
- College of Optometrists in Vision Development. (n.d.). Convergence insufficiency treatment trial - College of Optometrists in Vision Development (COVD). Retrieved April 2015, from <http://www.covd.org/?page=CITT>
- Convergence insufficiency. (n.d.). Convergence insufficiency treatment trial - attention & reading trial (CITT-ART). Retrieved April 2015, from http://www.convergenceinsufficiency.net/Default.asp?id=0&fn=Convergence_Insufficiency_640x480_WMV.wmv&embed=0

- Hardison, C. (2014, November). *Educating young eyes* [PowerPoint slides].
- Heiting, G. (2014). Vision therapy for children when glasses aren't enough.
Retrieved from http://www.allaboutvision.com/parents/vision_therapy.htm
- Mozlin, R. (2010, March 17). Vision therapy ? where is the evidence? | COVD
Blog. Retrieved April 2015, from
<https://covdblog.wordpress.com/2010/03/17/where-is-the-evidence/>
- National Commission on Vision & Health. (2015). Retrieved from
<http://www.visionandhealth.org/.../FactsheetVisionexams123008MAS26.pdf>
- Obena, B. (2013). *"eye" don't see the connection between vision and learning in the Yakima Valley!* Toppenish, WA: Author.
- Optometric Extension Program. (2011). Vision in the classroom.
Brochure
- Optometrists Network. (n.d.). What is convergence insufficiency disorder?
Retrieved March 2015, from <http://www.convergenceinsufficiency.org/>
- Pennsylvania Optometric Association. (2011, August 8). Increased classroom
technology makes eye health more important for students.
Retrieved April 2015, from <http://pennsylvania.aoa.org/x18963.xml>
- Piquette, N., & Boulet, C. (2013). Visual impediments to learning. *Optometry & Visual Performance*, 1(4), 203.

Prevent Blindness Georgia. (n.d.). Children's Vision Screening.

Retrieved April 2015, from <http://georgia.preventblindness.org/childrens-vision-screening>

Shin, H., Park, S., & Maples, W. (2011). effectiveness of vision therapy for convergence dysfunctions and long term stability after vision therapy. *Ophthalmic and Physiological Optics*, 31, 180-189.

Washington State Legislature. (n.d.). *RCW 28A.150.200: Program of basic education*. Retrieved from

<http://apps.leg.wa.gov/rcw/default.aspx?cite=28A.150.200>

Washington State Legislature. (n.d.). *Chapter 28A.210 RCW: Visual and auditory screening of pupils -- Rules and regulations*. Retrieved from

<http://apps.leg.wa.gov/rcw/default.aspx?cite=28A.210&full=true#28A.210.020>

Washington State University. (2013, October 3). A vision to help: Life-changing, groundbreaking business is like physical therapy for eyes. *WSU News*.

Retrieved from <https://news.wsu.edu/2013/10/03/a-vision-to-help-life-changing-groundbreaking-business-is-like-physical-therapy-for-eyes/#.VUw3GLI0zIU>

Wolinski, C. (2014, January 9). 'Year of children's vision' gets a head start on healthy sight for 2014. Retrieved from

<http://www.visionmonday.com/eyecare/eye-health/article/year-of-childrens-vision-gets-a-head-start-on-healthy-sight-for-2014/#sthash.xyGVCMOx.dpuf>

Zaba, J. (2011). impact on education, literacy, social issues, & the workplace: A call to action. *Journal of Behavioral Optometry*, 22, 39-40.

APPENDICES

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Figure 2. Snellen Chart

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Figure 4. Graph of Pre-Intervention Words Read Per Minute Growth per Week

Figure 5. Graph of Post Intervention Words Read Per Minute

Figure 6. Graph of Average Bi-Weekly Words Per Minute Growth

Figure 7. Graph of Pre Vision Therapy Intervention Oral Fluency Assessment

Figure 8. Graph of Post Vision Therapy Intervention Oral Fluency Assessment

Figure 9. Graph of Second Grade MAPS Standardized Assessment Reading Data

APPENDIX A

WHEN STUDENT

Writes up- or downhill _____

Repeats letters within words _____

Omits letters, numbers or phrases _____

Misaligns digits _____

Covers one eye _____

Tilts head _____

Fails to recognize same word when repeated in text _____

Fails to visualize _____

Makes mistakes when copying from chalkboard _____

Writing poorly spaced or crooked _____

Unable to stay on ruled lines _____

Poor placement of words on page _____

OTHER PROBLEMS

Must feel things to understand _____

Repeatedly confuses right and left _____

Difficulty with similarities and differences _____

Avoids desk work _____

Blinks, squints, rubs eyes _____

Fatigues easily _____

Teacher or Observer _____

School _____

Phone or Address _____


Consult a Behavioral Optometrist

If any of the problems listed on the Checklist of Vision Problems is marked, the child should be further evaluated by a behavioral optometrist.

Behavioral optometrists spend years in post-graduate, continuing education to master the complex visual programs prescribed to prevent or eliminate visual problems and enhance visual performance.

Not all optometrists practice behavioral optometry, which includes developmental and functional optometry. Yearly vision evaluations are recommended to make sure the visual system develops properly.

For more information on finding a behavioral optometrist in your area, please log on to the Optometric Extension Program Foundation website at www.oepf.org. Go to "Find an Optometrist" on the pull-down menu and input your city/state/zip code into the form to start your search. Or, call or write to the OEP Foundation at the address below.




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VISION
in the
CLASSROOM



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OPTOMETRIC EXTENSION PROGRAM

This information was prepared to help teachers and consultants identify children's visual problems that could interfere with learning and classroom performance.

Nearly all the visual problems that deter children from doing well in the classroom will NOT be uncovered by the Snellen eye chart, nor by most stereoscopic devices. The value of these school screening devices is to identify those children who cannot see clearly.

VISION IS MORE THAN CLARITY

It is the ability to visualize, understand and apply the information that comes through the eyes. Children with 20/20 sight may not have these abilities. Therefore, learning problems are often related to vision problems.

Teachers are the best screeners. They observe the child functioning in the classroom. The appearance of irritated eyes, squinting and frequent blinking are PHYSICAL signs of visual problems. A child's PERFORMANCE is affected by problems with eye movement, eye teaming, eye-hand coordination, and visual perception.

EYE MOVEMENT PROBLEMS

The information obtained by the child will be reduced if eye movements are slow or clumsy, if the eyes jump, "stutter" or lose their place on instructional materials.

EYE TEAMING PROBLEMS

While our eyes are supposed to work as a team so that they perform as one, this teaming is not guaranteed by design. It must be acquired through use during the preschool years and not all children adequately develop this skill. It can interfere with learning, especially in the areas of comprehension and spatial relations.

EYE-HAND COORDINATION PROBLEMS

Eye-hand coordination problems are noted as a lack of skill in drawing or writing. Paper work shows poor orientation on the page and an inability to stay within the lines when coloring. Often the child will continue to be dependent on his or her hand for inspection and exploration of toys or other objects.

VISUAL FORM PERCEPTION PROBLEMS

Form perception problems usually are a result of difficulties in the discrimination of visible likenesses and differences. There is confusion with similarities, inattention to slight differences, reversals in reading and reversals of letter forms. This produces difficulties in spelling and writing.

REFRACTIVE STATUS PROBLEMS

Nearsightedness (myopia), farsightedness (hyperopia), astigmatism and focusing problems interfere with the child's comprehension processes and classroom participation. These problems can be developing even though the child may see 20/20 on a Snellen Chart. They need prompt attention by a behavioral optometrist who treats both vision and sight.

THE CHECKLIST

This checklist is designed to assist the teacher or consultant in communicating with clinicians and parents. It is particularly useful in identifying those children who did well academically in the very early grades and later developed problems.

CHECKLIST OF VISION PROBLEMS

Student's Name _____

Date _____

APPEARANCE OF EYES

Reddened eyes or lids _____

Eyes tear often _____

Encrusted eyelids _____

Frequent styes on lids _____

COMPLAINTS WHEN USING EYES

Headaches _____

Burning eyes _____

Itching eyes _____

Nausea after reading _____

Print blurs _____

Double vision _____

TEACHER'S OBSERVATIONS WHEN STUDENT READS

Head movement _____

Loses place often _____

Needs finger to keep place _____

Omits words frequently _____

Re-reads lines _____


Skips lines _____

Short attention span _____

Fails to recognize some words _____

Confuses similar words _____

APPENDIX B




Pasco Vision Clinic, P.S.
Vision Care for the Whole Family

Specializing in Pediatric and Developmental Vision
Phone (509) 547-8409 | Fax (509) 544-7875

1906 North 20th
Pasco, Washington 99301

CONTACT LENSES WWW.PASCOVISIONCLINIC.COM VISION THERAPY

MARSDEN BALL (Smooth Eye Tracking)




PURPOSE: To develop the ability to move your eyes easily and smoothly in all directions without moving your head or body so that visual processing and attention skills are maximized. This exercise will also help develop the central and peripheral cooperation.

Material: Rubber ball and an 8-10 ft. cord

Procedure:

- Suspend a ball from the ceiling so the ball may be adjusted to various heights ranging from 12"-16".
- Lie on your back with your nose twelve inches under the ball.
- Gently swing the ball in each of the following directions.



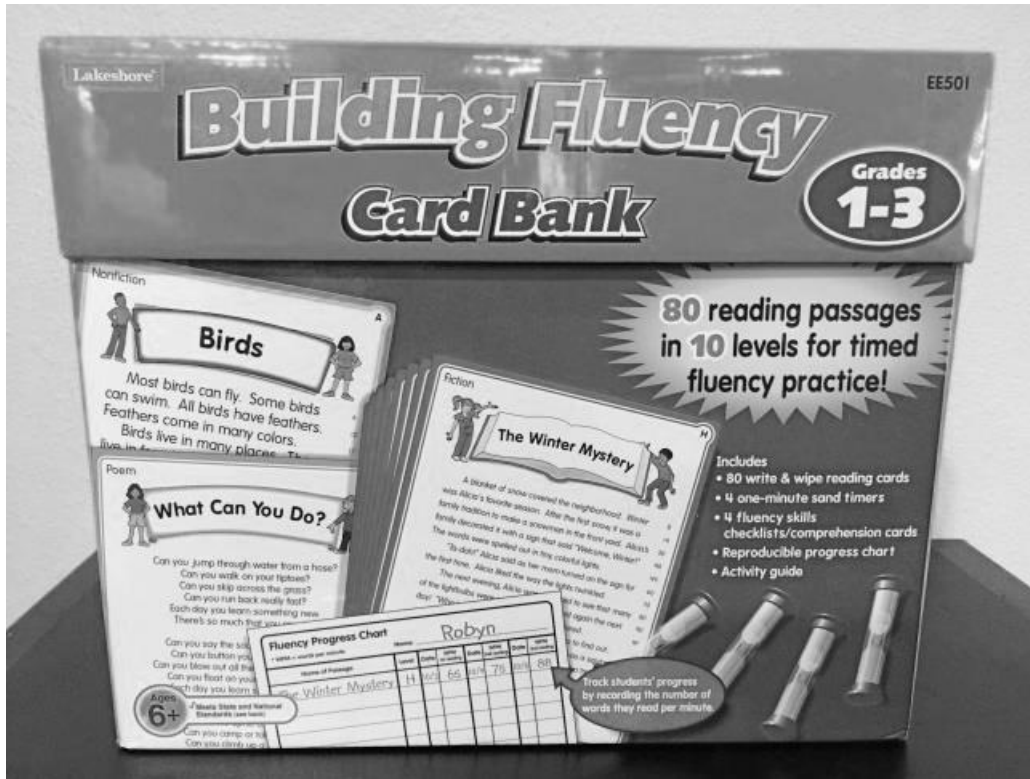
- Keep your eyes right on the ball. Do not move your head or body.
- Spell, count or say the alphabet while continuing the activity.
- Be aware of other objects in the room. (Name the objects you see as you continue to follow the ball).

- Repeat procedure while standing up, if you were instructed by your doctor or therapist.
- Repeat procedure while sitting down, if you were instructed by your doctor or therapist.

Questions to be discussed:

1. Are you watching the ball?
2. Can you feel your eyes move?
3. Do your eyes ever jerk?
4. Is your head moving?

APPENDIX C



APPENDIX D



2011 Normative Data Reference Status Norms of RIT Scores

Mathematics Norms (RIT VALUES)

Grade	Beginning of Year	Middle of Year	End of Year
	Mean	Mean	Mean
K			156.1
1	162.5	172.2	179.0
2	178.7	185.9	191.3
3	192.3	198.7	203.5
4	203.5	208.6	212.4
5	212.7	217.5	220.7
6	220.1	223.2	226.0
7	225.7	228.5	230.9
8	230.0	232.6	234.4
9	233.2	234.2	235.3
10	235.3	236.6	237.5

Reading Norms (RIT VALUES)

Grade	Beginning of Year	Middle of Year	End of Year
	Mean	Mean	Mean
K			155.1
1	160.0	170.1	176.1
2	175.9	183.4	189.2
3	190.2	194.8	199.2
4	199.6	203.0	206.3
5	207.1	209.9	212.4
6	212.5	214.2	216.2
7	216.6	218.2	219.6
8	219.5	221.4	222.6
9	221.8	222.2	222.9
10	222.9	223.3	223.9

Language Usage Norms (RIT VALUES)

Grade	Beginning of Year	Middle of Year	End of Year
	Mean	Mean	Mean
2	175.4	185.3	190.0
3	190.9	196.2	200.0
4	201.0	204.7	207.4
5	207.4	210.4	212.4
6	212.2	214.3	216.0
7	215.9	217.5	218.9
8	218.7	220.3	221.4
9	221.0	221.2	221.7
10	221.5	222.0	222.6

In the samples, each district's base school calendar was used to determine instructional days. Using the instructional days data, time frames for the beginning of year tests, middle of year tests, and end of year tests were established. The centers of these time frames were roughly 20 days, 80 days, and 130 days from the beginning of the academic year of the student's school for the fall, winter and spring terms, respectively.

General Science Norms (RIT VALUES)


Grade	Beginning of Year	Middle of Year	End of Year
	Mean	Mean	Mean
3	189.2	192.7	195.5
4	196.2	198.5	200.5
5	201.1	203.7	205.4
6	205.2	206.6	207.9
7	208.1	209.4	210.7
8	210.8	212.1	213.1
9	213.2	213.7	214.5
10	215.0	215.5	216.1

Concepts & Processes Norms (RIT VALUES)

Grade	Beginning of Year	Middle of Year	End of Year
	Mean	Mean	Mean
3	188.1	192.0	194.7
4	195.4	197.7	199.7
5	200.7	203.0	204.5
6	204.8	206.1	207.3
7	207.6	208.7	209.9
8	210.4	211.7	212.6
9	213.2	213.7	214.5
10	213.4	213.8	214.2

APPENDIX E

Fiction A



Gus is a dog. Gus can run. He 8
can jump. Gus likes to dig. He digs 16
in the dirt. He digs a big hole. Gus 25
digs and digs. The hole is too big. 33
Gus falls in. He cannot get out. He 41
needs help. I can help Gus. I get 49
down in the hole. I pull him out. 57
Gus is happy. He runs and jumps. 64
He licks my face. I give him a big 73
hug. 74

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