The Effects of Using the Neurological Impress Method on Four Learning Disabled Students

Thesis

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by

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Abstract

The purpose of this study was to look at the effects of using the Neurological Impress Method to improve reading fluency and word accuracy in four learning disabled fourth graders from a rural school district in Western New York. All of the subjects were recommended for primary instruction in reading by their previous year's special education teacher. Two of the four subjects had expressive language difficulties and were receiving speech services three times per week. Subjects self-selected books based on their reading interests. Each child participated in over 40 sessions with the researcher in a one-to-one format, five days a week, in 10 minutes sessions, over a period of three months.

Results of the study indicated at least a doubling of word rate per minute for each student and an increase in word accuracy for all subjects. Teachers and parents have reported an increase of the students' self confidence while reading as well as the number of books being read independently at home and in school. Profiles developed by previous researchers of students who would most likely benefit from the Neurological Impress Method were confirmed by this study and may prove useful for classroom teachers.

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CHAPTER I

Statement of the Problem

The Neurological Impress Method is a holistic method of oral unison reading used to build fluency in students who have not mastered reading through traditional methodologies. The Neurological Impress Method was first introduced in the early nineteen sixties by R.G. Heckelman. Over the years since it was first introduced, there have been many research studies conducted with this method on reading disabled populations, including those with learning disabilities. Several researchers have found that for those students with learning disabilities, the most common problem area is reading. Between 85% to 90% of all students referred for mild handicapping conditions have word identification difficulties (Helfeldt & Henk, 1985; Reetz & Hoover, 1992). Downs and Morin (1990) report that a vast majority of students referred for reading comprehension problems lack fluency and or accuracy in word pronunciation skills. Manzone (1989) reported that for children with learning disabilities, reading for comprehension is often difficult and they may have more problems retaining and recalling information. They also lack necessary skills to help relate what is read to prior knowledge and life experiences. While there is no evidence that one reading intervention will be successful with all disabled readers, NIM has been viewed as one component of an instructional program to meet the needs of diverse learners (Helfeldt & Henk, 1985; Reetz & Hoover, 1992).

Purpose

The purpose of this study was to look at the effects of using the Neurological Impress Method to increase fluency and word accuracy in four learning disabled fourth graders who have been identified as having documented weaknesses in the area of reading.

Research Questions

1. Is there a strong trend of change in reading fluency for each student from baseline to final assessment scores for word rate per minute?

2. Is there a strong trend of change in word accuracy between baseline and final assessment scores for each student?

3. Is there a profile that can be developed from this research and other studies done in the past that would help teachers identify those students with reading difficulties who would most likely benefit from using NIM?

Need for the Study

While NIM has been shown to be an effective instructional strategy to help students with reading disabilities make gains in fluency, this researcher had never used the Neurological Impress Method while working with students who have learning disabilities. An informal survey (see appendices) sent out to various remedial instructors in the researcher's district revealed that the majority of teachers in such positions had either never heard of NIM, or if they did, they had never

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used NIM with students. Many of these teachers were looking for a method that could build fluency with poor readers.

Children with reading disabilities often have failed to learn to read through traditional reading approaches. The Neurological Impress Method is a multisensory approach in which hearing, speech, sight, and tactile modalities are employed. Henk, Helfeldt, and Platt (1986) believe that NIM gives students who are not fluent readers, a "feel" for fluency. In a fairly short amount of time, usually at around four hours of instruction, many students experience significant gains in fluency and word recognition (Anderson, 1981). Because this method is very simple to use, it takes very little training. The one-to-one interaction in a non-threatening environment helps to produce higher reading performance in many individuals. Because NIM is simple to use and has been researched over many years with a number of populations, with statistically significant results, it warrants a closer look as an instructional tool that teachers can use to build fluency in some disabled readers.

Definition of Terms

Neurological Impress Method:

This is a multisensory remedial reading method using hearing, speech, sight, and tactile modalities to build fluency in slow and hesitant readers. The instructor and the student read aloud together, in unison, while the instructor slides his or her finger under each word as it is read. The instructor reads into the right ear of the student, while maintaining a quick pace for approximately 10 minutes (Heckelman, 1986).

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Fluency:

This is a combination of speed and accuracy when reading (Homan, Klesius, & Hite, 1993).

Strong trend of change for word rate per minute:

This is defined as a doubling of word rate scores from baseline to final assessment scores.

Strong trend of change for accuracy per minute:

This is defined as a ten percent improvement from baseline to final assessment scores for word accuracy.

Learning Disabled Students:

Those students who have been classified as such by the district's Committee on Special Education in accordance with the definition of the State of New York.

Limitations

The subjects for this study comprise only four students with learning disabilities from a fourth grade classroom in a rural school district. This limits application of conclusions to similar groups.

The Neurological Impress Sessions were not daily for some subjects, as some students for this study were often out ill from school. There were also several snow days in a row right after sessions started. However, every effort was made to make up sessions.

While every effort was made to keep NIM sessions in a quiet room, due to space needs, several times sessions were interrupted and had to

be completed in another room. This was a source of continuous distraction for the students involved.

CHAPTER II

Review of the Literature

The Neurological Impress Method (NIM)

Neurological Impress has been characterized as a holistic, total immersion method of oral unison reading used to build fluency in students who have failed to master reading through traditional approaches (Brown & Proctor, 1980; Eldredge, 1989; Heckelman, 1986; Henk, Heldfeldt & Platt, 1986; Lorenz & Vockell, 1979; Miller, 1969). The student and the teacher read the same text aloud simultaneously. The student sits slightly in front of the teacher, who sits slightly to the rear and right of the student. Both hold the text. The teacher's finger slides under each word as it is spoken in unison. The teacher maintains a quick, continuous rate of oral reading. The teacher's voice is directed into the right ear of the student so that the words are seen, heard, and said at the same time. At first, the teacher's voice leads, and the student may sound as if he or she is mumbling, but in subsequent sessions, the student's voice will begin to take the lead, as the teacher consciously reduces the volume of his or her voice, as noted by Henk et al. No corrections are made during or after the reading session.

Heckelman (1986, 1969) and Yurek (1988) theorized that most remedial readers have not been exposed to correct fluent models of reading. Henk et al.(1986) further believe that NIM gives students who are not fluent readers a "feel" for fluency. This method also exposes students to high frequency words in print (Eldredge, 1989). This

multisensory flooding used in NIM is thought to "impress" or "etch" in word memories on the neural processes through the teacher's modeling of fluent reading.

What is the overriding goal in Neurological Impress? It is to build fluency and thereby increase comprehension in disabled readers. One objective in each session is to cover as much material as possible in 10 minutes (Henk et al., 1986) The reading material chosen for the first few sessions should be from high interest, low readability books. Materials chosen should be slightly below the student's current instructional level, but certainly varied and interesting to the student (Anderson, 1981).

How long before gains in fluency are noted? In previous studies, gains were usually noted within four hours of instructional time (Anderson, 1981). Cook, Nolan, and Zanotti (1980) found that even students with auditory perception problems made significant gains in both silent and oral reading when exposed to NIM for a minimum of 10 minutes per day for 15 weeks. Helfeldt and Henk (1985) found that three sessions per week for 10 weeks were sufficient to help incarcerated, adult students make significant gains in reading. Partridge (1979) cited a study by Gibbs and Proctor (1977) in which students made gains in reading, as judged by the Stanford Achievement Test , in as little as eight weeks, at 15 minutes per day. In a study cited by Henk, Helfeldt, and Platt (1986), children with learning disabilities made significant gains in fluency, word recognition, and comprehension in just 7 weeks of instruction using the NIM.

History of Neurological Impress and Why It Works

The Neurological Impress Method was developed by psychologist R.G. Heckelman. The basic idea for NIM originated from a research summary published in the Speech Therapy section of The Psychological Bulletin in 1958. The summary described a research project in which the voice of a stutterer was fed back into the subject's ears, which effectively stopped the stuttering. Heckelman wondered whether there might be a neural basis for reading. NIM evolved from this study. It was an attempt to "utilize alternative neural pathways through a strong reinforcement technique with a multisensory approach" (Heckelman, 1986, p.412). This idea however was not a new one. NIM was similar to Kenneth Hoskisson's Assisted Reading (Brown & Proctor, 1980). This was an oral reading approach in three stages for emergent readers in which the chosen text was read aloud by the parent or instructor while the child echoed what was read. The material was then reread with the child several times while the teacher slid her finger under each word as it was spoken. The child then switched roles in stage three and attempted most of the reading while the teacher provided any needed words (Anderson, 1981).

In the early 1960's, Heckelman's first school wide experiment with NIM occurred in Merced County, California. Of the 24 students in his experimental group, all of whom read at least 3 years below grade level, the mean gain in reading comprehension was 1.9 grade levels for seven hours of instruction over a 6 week period, a statistically significant gain.

Today, researchers have strong evidence that supports Heckelman's theory of a neural basis for reading. New technology has been developed which enables scientists to look at the brain as reading occurs. These glimpses of brain activity as reading occurs reinforces the need for further brain-based research as it relates to the processes of reading (Arena, 1980, Heckelman, 1986).

Why do holistic approaches like NIM seem to work for many children who have failed to learn to read through traditional reading methods? Rasinski (1989) argues that holistic approaches are more effective than a skills oriented approach in promoting reading growth of poor readers. The Neurological Impress Method is a multisensory, holistic method to increase reading fluency using hearing, speech, sight, and tactile modalities. The student is given a model of fluency to follow so he or she knows what "normal" reading sounds like. This is important as Rasinski (1989) and Allington (1987) both have indicated that reading fluency techniques are often neglected in both regular and remedial instruction. Heckelman (1986) stated the following:

> The goal of NIM is to bring about changes in the functional systems of the brain which may have suffered due to lack of development, or are operationally impaired. The task of reading is begun at the individual's workable level and is gradually upgraded. (p.412)

The procedures that Heckelman developed for NIM are very specific and have a theoretical foundation. Why is the right ear of the student spoken into by the teacher? In NIM, it is believed that reading into

the right ear probably crosses over into the left hemisphere of the brain. The right hemisphere may be a "way station" to the left side of the brain which is usually responsible for many language functions. The "unison" reading keeps the student focused and competing stimuli are screened out that could interfere with the reading process. Heckelman (1986) noted that through use of the PET Scan, researchers at the University of Pennsylvania observed increased brain metabolism in the right temporal lobe of subjects who were being read to in either ear.

Because poor visual tracking is frequently found in dyslexics and other disabled readers, skipping over words and lines of texts can be effectively avoided by the sliding motion of the finger under each word as it is being spoken. This sweeping movement of the finger helps negate left-right confusion originating in the brain. Heckleman (1986) found that the sliding finger motion helped those readers with visual search and spatial dyslexia problems. If the finger movement stopped or paused, and was not continuous, the remediation was not as effective. He found that even those students with dysphonetic dyslexia (poor sound symbol association, poor sound blending) showed gains from NIM. The large amount of material covered in each session, plus the brisk reading speed serves an important purpose. It is believed that the memory storage parts of the brain are exposed to increased stimulation during these quick sessions, which may possibly increase neurotransmitters in the brain that aid memory storage. Heckleman (1986) and others have

theorized that increased chemical responses via neurotransmitters may help children with delayed acquisition of reading skills.

What purpose is served in having the student read at the same pace as the teacher? Researchers now know that sight and sound stimuli are processed in different parts of the brain. The simultaneous processing of the student's own voice and the teacher's, stimulates those areas of the brain and keeps the student focused. The quick reading pace, the relaxed environment, and the unison oral reading may help override distracting stimuli entering through the other senses.

Why is one of the objectives during NIM sessions to read as much material as possible within 10-15 minutes? The child's exposure to many words allows more time to be spent on reading and the enjoyment of it than on the decoding and analysis of words, and/or the correcting of reading errors (Manzone, 1989).

There is one more component of NIM that needs to be considered. That is what Heckelman (1986) calls a "psychological affective" component. As a child becomes more fluent in oral reading, at some point, the child's voice will go from what sounds like mumbling to one that begins to keep pace with the teacher's during subsequent NIM sessions. There comes a "blending, in rhythm and sonority" which Heckelman (1986) says produces a "hypnotic effect" which he believes helps diminish stressful feelings in the right hemisphere of the brain that could interfere with the reading process. Heckelman theorizes that stress reduction allows for better utilization of neural pathways, increased

cognitive functioning, formation of mental images while reading, and an increase of pleasure while reading (Arena, 1980; Heckelman, 1986). As attention is diverted away from laborious decoding and word analysis, the student's mental energy is freed up to gain meaning from the text (Layton and Koenig, 1998). And that is the point of holistic reading instruction- to intensify the comprehension process (Rasinski, 1989).

McAllister (1989) noted in her study that fourth grade test subjects who received NIM sessions from trained tenth graders, reported that all her test subjects enjoyed reading more and felt more confident when reading aloud. Because of the confidence gained, her test subjects remained motivated and enthusiastic about reading sessions for the entire study (12 weeks in duration). Henk (1981) believes that it would be a "grave error" to ignore the motivating effect that NIM appears to have on students because "the child's attitude may very well be the single most important determinant of reading success" (p.13). Henk (1981) citing Mathewson's (1976) model of the reading process, believes that as the child experiences success and acceptance through NIM, his or her entire attitude changes towards the reading process, promoting increased achievement and a desire to learn. These attitude changes, in turn, promote increased attention and comprehension for the child.

Over the years, there have been a number of adaptations of NIM. Some of these methods call for the teacher's voice to be taped and used in a group session without the teacher being physically present (Henk, Helfeldt, & Platt, 1986; Partridge, 1979). Helfeldt and Henk (1986) cited

the work of Hollingsworth (1970) in which no statistically significant improvements were made in fluency by children who listened to the tape recordings of their teacher's reading of selected texts. These researchers concluded that one-to-one interaction is critical for successful performance. Some programs have utilized paired or buddy reading, in which two students read the same text together out loud, each one helping the other through the text. Eldredge (1989) reported on dyad reading, in which a peer is trained to be a "lead reader" to help the less able reader. She successfully used this technique to help a dyslexic adult male to read for the first time in his life. McAllister (1989) successfully trained sixth grade students in NIM and paired them with fourth graders who had reading disabilities. Results of her study indicated that each fourth grade students made gains of at least one-half year in oral word reading after just 12 weeks of instruction. She sees dyad reading as a useful technique to use in classrooms where teachers have little available time to assist all struggling readers. Rasinski (1989) noted that choral reading and echo reading are also adaptations of NIM which can help less able readers "gain control of their reading and move toward independence" (p. 7). An adaptation of the NIM has even been used to successfully increase spelling and sight word accuracy in twelve high school seniors deficient in reading and spelling (Traynelis-Yurek, 1988). Some researchers believe, however, that it is the one-to-one interaction with students that produces the most successful outcomes (Heldfeldt & Henk, 1985).

While many instructional techniques have been researched and published in the remedial reading literature, there is no one reading intervention that will be successful with every disabled reader. But NIM should be viewed as one component of an instructional program to meet the needs of diverse learners (Ekwall & Shanker, 1993; Helfeldt & Henk, 1985; Henk, 1981; Rasinski, 1989; Reetz & Hoover, 1992). In the meantime, research continues on NIM, which Heckelman (1986) calls "deceptively simple in usage, but multi-faceted when analyzed" (p. 419).

Characteristics of students who may benefit from NIM

For children with learning disabilities, the most common problem area is reading (Heckelman,1986; Henk, Helfeldt, & Platt, 1986; Reetz & Hoover, 1992). Manzone (1989) noted that reading comprehension is a difficult skill to children with learning disabilities to acquire. Between 85% to 90% of all students referred for mild handicapping conditions have word-identification difficulties. Other researchers have reported that those who have learning disabilities often enter secondary programs with reading skills ranging from total word blindness to a third grade level (Reetz & Hoover, 1992). Frequently, learning disabled students are viewed as passive readers, exercising little control over how they read (Henk et al., 1986). Downs & Morin (1990) reported that a large majority of students referred for reading comprehension problems lack fluency and or accuracy in word pronunciation skills. Rasinski (1989) believes difficulties in reading fluency are a major factor contributing to lack of satisfactory progress in a majority of elementary level readers.

With this in mind, what are some characteristics of students who may benefit from a fluency building technique such as NIM?

Down's & Morin (1990) list the following characteristics:

* Slow readers, who read less than 80 words per minute as comprehension breaks down at such a slow rate. Words fade from memory before they can be linked to meaning (Blanchard, 1981).

* Those students who make frequent repetitions, hesitations, or miscalls.

* Those students reading far below grade level.

* Those students reading too fast and ignoring punctuation.

* Students with lack of expression and inflection in voice tone while reading.

* Students unwilling to take risks while reading orally in individual sessions.

* Students with erratic eye movements, or who skip words, or jump lines while reading orally. Those who often lose their place often while reading (Heckelman, 1986).

* Students who read in a laborious, word-by-word fashion.

* Disabled readers identified with dysfunctional memory processes in either short or long term memory.

NIM is a technique best used with students whose profiles suggest that fluency training is necessary. Rasinski (1989) has suggested that fluency instruction should be a daily part of reading instruction. According to

some researchers, fluency techniques like NIM, to be most effective, do require some "immediate and analytic word knowledge" on the part of the student (Henk et al., 1986, p. 204).

From the research, it appears NIM would be least effective when used on students displaying the following characteristics:

* Already fluent readers with poor comprehension skills.

* Students with virtually no sight word or word attack skills.

* Children with poor expressive and receptive speech or language impairments (Arena, 1980).

Summary

While no one reading strategy works for all readers who have difficulties, Neurological Impress has been used to increase fluency in many students who have failed to master reading through traditional methodologies. Fluency training is important because less able readers focus more attention on decoding than on comprehension. It appears that one possible consequence of remedial reading may be that a student concentrates so hard on word analysis that the rich context surrounding the target word and which give clues to the meaning is lost which makes not only fluency impossible but comprehension as well (May, 1990). Heckleman (1965) called this type of child "phonics - bound". Students are not able to focus on reading for meaning until they can read fluently.

NIM is a simple technique to use, and students show gains in a fairly short amount of time, usually within four hours of instruction. Even

modifications of NIM have shown successful results in a number of studies. The affective benefits of NIM are impressive as students remain motivated and interested throughout the sessions. Many studies have shown that subjects enjoyed reading more and felt more confident when reading aloud. The students' confidence tended to transfer to other reading situations as well.

It is hard to ignore any reading technique that has been shown to increase motivation, boost self-confidence, and increase fluency and comprehension in such a short amount of instructional time. Research on the Neurological Impress Method provides strong justification for utilizing this technique as one component of a remedial reading program.

CHAPTER III

Design of the Study

Purpose

The purpose of this study was to look at the effects of using the
Neurological Impress Method to increase fluency and word accuracy in
four fourth grade students with learning disabilities who have
documented weaknesses in the area of reading. Moreover, these
students all saw themselves as non-readers and were recommended for
direct instruction in the area of reading by their previous year's special
education teacher.

Questions to be Answered

1. Is there a strong trend of change in reading fluency for each
    student after a minimum of 40 sessions in NIM when baseline and
    final assessment scores for word rate per minute are compared?

2. Is there a strong trend of change in word accuracy for each student
    between baseline and final assessment scores after 40 sessions
    of NIM?

3. Is there a profile that can be developed from this research and
    other studies done in the past that would be useful to teachers for
    identifying those students with reading difficulties who would most
    likely benefit from using NIM?

Methodology

Subjects: The four children with learning disabilities who participated in this study were from a rural school district in western New York State. They were in the fourth grade and had all required direct instruction for reading since the beginning of the school year. Their educational profiles all suggested that reading difficulties have been the area of greatest concern since the beginning of their formal education. The mean age of the children involved in this study was 10 years old. Two of the subjects had repeated a year in the second grade. One subject has a history of hearing difficulties due to fluid build up in the inner ear and has had frequent absences. This same student also has a history of "lazy eye" for which he wears corrective lenses.

Materials:

* Self- selected books

* Tape recorder

* Anecdotal notes on each session

* Graphs showing the word rate and accuracy per minute for each
  student

Procedure:

The interviewer met briefly with each student one day prior to the beginning of formal NIM sessions. Each student was given a simplified explanation of the NIM procedure and why this method was being implemented as part of his or her reading instruction. At this time, each

subject also chose a book from a varied collection of titles that had been identified as having a basic readability level below 35 DRP units. The researcher chose books below 40 DRP to reflect each student's instructional reading level on the Degrees of Reading Power Test given the previous year in May by the school district. Each student's scores on the DRP test from the previous school year are as follows: Matt: 17, Bob:14, Kathy: 23, Devin: 38. Expectations for exiting third graders according to district DRP Standards is 42 for the instructional level.

Each student was tested for word rate and word accuracy per minute using the book he or she chose. The results were then placed on a graph for the student to visually track how much he or she progressed as the NIM sessions continued. Students were tested after every 10 sessions for a total of 5 scores (including the pretest score). Scores were noted after each test on the students' graphs.

This study covered 40 sessions over a time period from January 11, 1999 through April 12, 1999. Each student spent approximately 10 minutes reading aloud with the researcher in individual sessions using the NIM procedure (outlined in the appendix). Because each student was involved in a number of extra curricular activities dispersed throughout each day, this researcher chose the period of time from 8:50 a.m. to 9:30 a.m. to conduct NIM sessions. Subjects came willingly to each session, as the students in their classrooms were engaged in D.E.A.R. time during that time frame. At no time did any student involved

in the NIM sessions miss any class instructional time due to this procedure.

Analysis of Data

The data obtained from this study were analyzed descriptively, looking at the characteristics, needs, aptitudes, and motivations of targeted students. The use of descriptive statistics is a way to look at information about individuals involved in the study and does not attempt to relate the findings to any other group or larger population (Newman & McCormick, 1995). The changes that emerged were not predicted before the data was collected but emerged as the researcher analyzed the data from field notes, observations, and before and after analysis of word rate and accuracy per minute for each subject .

CHAPTER IV

## **Results of the Study**

Purpose

The purpose of this study was to look at the effects of using the Neurological Impress Method to increase fluency and word accuracy in four fourth graders who have learning disabilities and have been identified as having documented weaknesses in reading in previous grades.

Question #1

Is there a strong trend of change in reading fluency for each from baseline to final assessment scores for word rate per minute?

The data show that for each subject (see Table 1) showed at least a doubling of word rate scores from his or her baseline scores to the final scores. Strong trend of change was defined as a doubling of word rate from baseline to final assessment.

Table 1
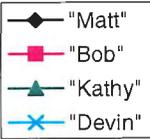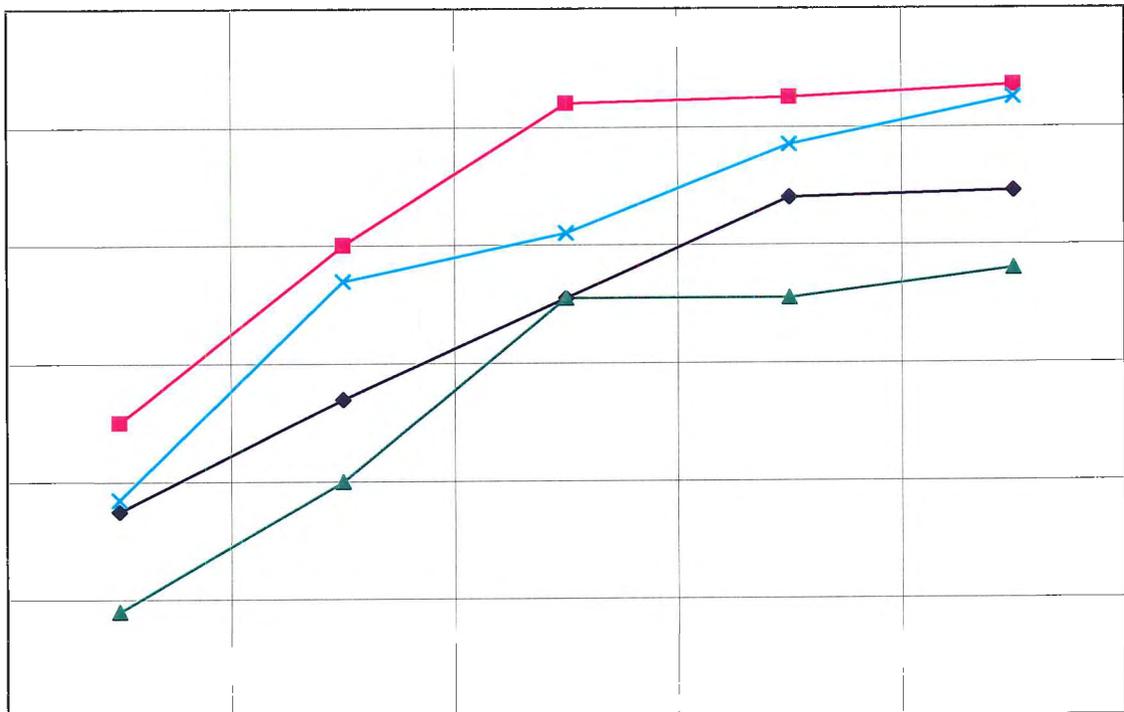
	Pretest	Test1	Test2	Test3	Test4
"Matt"	35	54	71	88	89
"Bob"	50	80	104	105	107
"Kathy"	18	40	71	71	76
"Devin"	37	74	82	97	105

Is there a strong trend of change in word accuracy between baseline and final assessment scores for each student? (defined as a ten percent improvement from baseline to final scores).

Each subject's word accuracy scores were high (over 85%) to begin with. Final assessment scores did reveal a strong trend of change for one student (Kathy), but did not for the remaining three. The pretest scores for those three subjects who did not show a strong trend of change already had accuracy scores that exceeded 90% (see Table 2).

Table 2
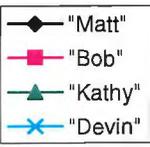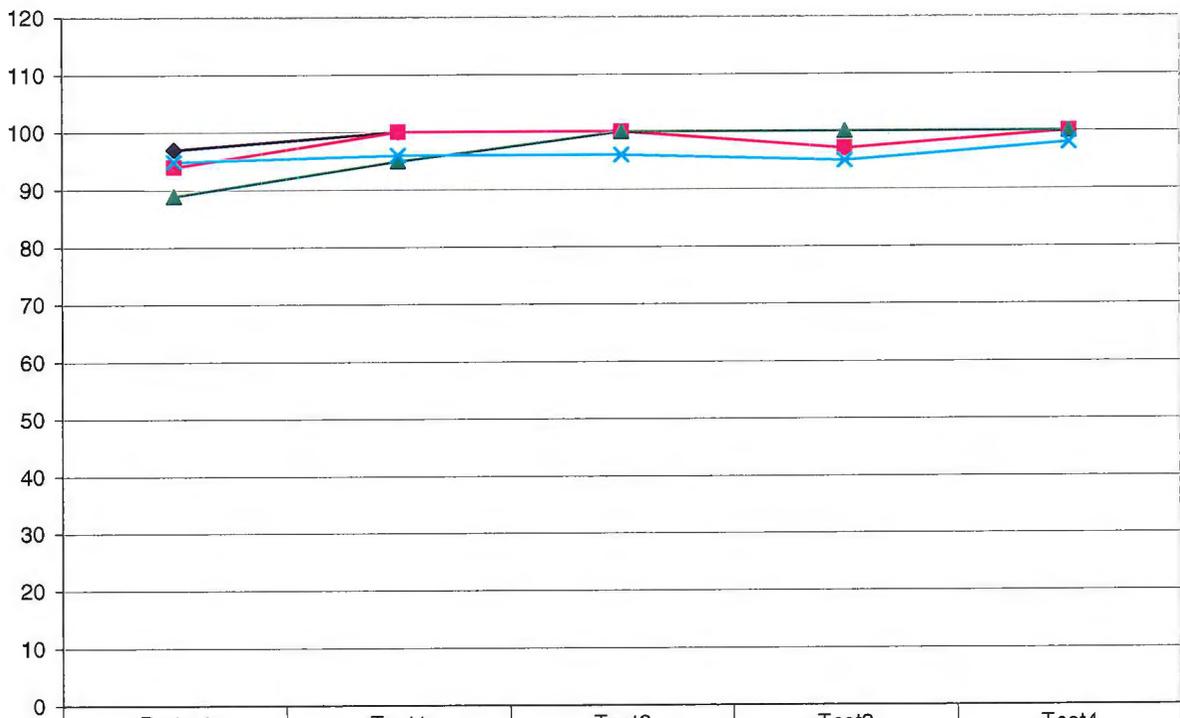
	Pretest	Test1	Test2	Test3	Test4
"Matt"	97	100	100	97	100
"Bob"	94	100	100	97	100
"Kathy"	89	95	100	100	100
"Devin"	95	96	96	95	98

<u>Question #3</u>

Is there a profile that can be developed from this research and other studies that have been done in the past that would help teachers identify those students with reading difficulties who would most likely benefit from the Neurological Impress Method?

Previous research (Downs & Morin, 1990) has indicated that the NIM is a useful technique to try with students who have failed to read through traditional methodologies. The subjects who participated in this study read in a laborious word by word fashion and as such, read slowly (less than 80 words per minute). Previous studies have indicated that comprehension breaks down at such a slow rate. This study confirmed that the profile developed by Downs and Morin (1990) as well as others others was helpful in targeting the four subjects for NIM training.

At the beginning of this study, all of the subjects saw themselves as basically nonreaders. Reading in front of their peers was a source of embarrassment and each subject would not risk reading aloud during class time. When the students realized that the NIM sessions were one-to-one with the researcher reading with the student, each subject began to relax and enjoy the sessions. They would actually race each other down the hall to see who would get to the room first. The affective benefits of NIM are most clearly seen from this study. Each student, in personal interviews with the researcher, expressed his or her delight in being able to "read" so fast. The classroom teacher reports that these

same students now volunteer to read to the class during share time, and the subjects appear self-confident when doing so. The teacher also reports that these students asked to share progress reports with the class. When each subject doubled his or her previous word rate per minute score, this information became a source of celebration for the entire class. Each subject has also set a goal that he or she would like to obtain as far as word rate per minute is concerned. Students are also selecting and reading more difficult books and are fully engaged during D.E.A.R. time in the classroom. Motivation and interest in reading remains high for all subjects.

To gain a better overall picture of each subject involved in this study, following is a brief synopsis of targeted students that may help clarify the discussion section. Students' names have been changed to protect their privacy.

Subject #1

"Matt" has experienced tremendous difficulty in reading over the primary grades. Part of his problem has been that he has significant hearing loss due to ongoing ear infections. He also battles asthma so he historically has been sporadic in his school attendance. Standardized testing (California Achievement Tests and Woodcock) showed virtually no gains made in word attack skills between second and third grade and only minimal gains were made in comprehension. Matt had repeated second grade in an effort to get him "caught up". At the beginning of fourth grade, Matt's hearing problems still had not been addressed

enough to satisfy questions as to what he could hear. He is in the process of having tubes put into his ears again, and a full hearing screen will finally be done. Matt has become an excellent lip reader. He is a creative student with a family history of reading difficulties (brother, father, and grandfather). Because of the hearing loss, it is difficult for Matt to hear differences in some letter sounds if they are not spoken with appropriate volume. He wears glasses (sporadically) for a "lazy eye." Mother reports that Matt's "good eye" must be protected or he will become legally blind. Matt is a friendly, well-liked student with excellent social skills.

During the NIM sessions, Matt had great difficulty keeping pace with the researcher during initial sessions, as previous research had indicated may happen. Because of the hearing loss, the researcher sat very close to Matt and spoke at a loud volume and with clear enunciation into his right ear. Of the four subjects , Matt had the most difficulty keeping pace with the oral reading, always staying one or two words behind the researcher. In trying to get him to assume the lead, the researcher would often reduce her volume, to see what would happen. Matt would then take the oral lead, but at a much slower pace. He was always reminded at the beginning of sessions to try and keep up with the teacher's pace. Matt also experienced difficulty actually sweeping his finger under each word as it was being spoken. The researcher was never able to relinquish control of the finger sweeping motion to Matt, as he would stop at each word, rather then sweep. It appears that his fine

motor coordination is poor, and he often confuses left and right. Around the 17th session, Matt began to read with much more expression than in the earlier session. It should also be noted that he has had the least number of sessions (42) of any of the subjects because of frequent absences.

Subject #2

"Bob" is a quiet student who prefers to be by himself, yet he has excellent social skills. He has also repeated second grade. From early on he has displayed delays in reading. He has much difficulty with expressive language and receives speech services three days per week. His vocabulary is limited and often has difficulty finding just the word he wants to describe something. His oral speech is slow and measured and he requires a great deal of think time before he is ready to share his thoughts orally and written. What is notable about Bob is that his word attack skills are excellent. The strategy he most often used when encountering an unknown word is to "sound it out". He therefore had few skills in his repertoire to use when figuring out unknown words.

From the very beginning of the NIM sessions, Bob was an enthusiastic participant. He would come to sessions early to set the chairs up and even set out the books that the students were working on. It should be noted that Bob has a slow, easy-going type of personality. He talks slowly and in general is a thinker much more than a talker. This researcher had doubts at the beginning of the sessions if Bob would be able to make his mouth move fast enough to become fluent. He

expressed a sincere desire to be able to read "like the other kids."

Motivation to improve his reading was apparent from the first session. He

read almost immediately with a close approximation of the researcher's

expression. If the researcher should happen to miss a word, Bob would

point it out by saying, "You missed this word!" He has completed a total

of 45 sessions, and has suggested the NIM sessions should continue

until June.

Subject #3

"Kathy" has experienced major delays in learning to read since

she began her formal schooling. She was referred to her school's

Committee on Special Education because of major academic delays in

second grade (especially in the reading, math, and language arts areas).

Early attitudes that kept surfacing in her anecdotal records include

extreme shyness, lack of self confidence, and a tendency to give up

easily when working. It was noted during Kathy's psychological testing

that she was still very tactile and "traced" words and shapes with her

fingers to imprint the word and shapes of letters in her memory. She has

and still receives speech services three times per week for expressive

language difficulties.

As a fourth grader, Kathy is an extremely creative student who is

heavily involved in dance and music classes. Skills learned during these

extracurricular activities have obviously transferred to the classroom.

While Kathy is quiet, she is far from shy in that she always volunteers to

perform in front of the class during Reader's Theater, class presentations, or Social Studies role playing segments.

It was the observation of this researcher that Kathy had the most difficulty of the four subjects in reading orally. She was often reduced to tears when speaking of her fears about never being able to learn to read. Her mother reported at home that Kathy spent a lot of time reading picture books, but avoided reading anything difficult. In her writing, she often demonstrates reversals of letters (b for d, for example), and has a difficult time organizing her thoughts. She is creative when, through oral prompts, she gets her ideas organized. When speaking, Kathy often demonstrates difficulty finding just the right words to express her feelings. Her speech is punctuated with pauses. She requires some think time when discussing issues during class time. Kathy seemed ready and motivated to try NIM especially when she discovered she did not have to read alone. Past teachers have noted that she gave up easily when decoding and was afraid to take risks. Despite her past history, Kathy quickly matched the speed and expression of the researcher, and stayed attentive throughout her 46 sessions of NIM.

Subject #4

"Devin" although a hard worker (as noted by previous teachers), came into the fourth grade with poor decoding skills and even poorer comprehension skills. Devin showed a number of word reversals while reading (such as "no" for "on"). He also displayed this same tendency while writing. He lacked self confidence and was very hesitant about

reading in front of his peers or teachers. He also appeared anxious when called on during class and avoided eye contact. Anecdotal records indicate he approached reading situations with great anxiety and he read in a slow, laborious fashion. All records indicated that Devin put an enormous amount of effort into his schoolwork. He has received private tutoring by a certified teacher all year long to help him solidify and maintain his skills.

After meeting with parents at the beginning of fourth grade, because of Devin's "squinting" it was advised he have a complete eye exam. He started wearing glasses a short time later for both distance and near.

During NIM sessions, Devin was cooperative and motivated. He would independently begin to talk about the story he was reading at the time of his sessions. He seemed to have a good grasp of the details of each book that he read. His reading, after about 15 sessions, became more fluent and the finger sweeping motion did not pose any difficulty for him. Since he has worn his glasses, Devin visually tracks much better, whereas before he would skip lines of text while reading. His parents report that he is very happy with his reading now, and he often reads for them at home. In looking at his error rate, Devin's pre and post test scores indicate he only achieved a 100% accuracy rate one time during the five testing sessions. However, in looking over the anecdotal notes taken after each session, the errors he made did not change the meaning of the sentences.

Summary

Each of the subjects showed at least a doubling of his or her fluency rate for words read per minute. One subject showed a quadrupling of word rate per minute from baseline to final assessment scores. One student showed a ten percent increase in word accuracy between baseline and final assessment scores, while the rest of the subjects showed word accuracy pretest scores already above ninety percent.

The affective component of NIM proved to be a catalyst for improved attitude towards reading as the subjects' regular classroom teacher has reported that the students are more willing to read aloud in front of their peers during whole class instruction, and they do so with confidence and increased willingness to take risks when stuck on a word.

The list of characteristics developed by previous researchers for those students who may benefit from NIM has proven helpful in this study. It was noted in previous studies that students with expressive or receptive language impairments showed the least improvement with NIM (Arena, 1980). Of the four subjects in this study, two were considered to have problems with expressive language and received speech services 3 times per week. At the time of this writing, Kathy and Bob will not be recommended for speech services next year as a result of passing scores on the Oral and Written Language Scales. The speech pathologist shared that Kathy's scores in particular were "outstanding" considering her past difficulties, and were now in an age appropriate

range. In spite of the speech difficulties, the handicapping condition for both students, is Learning Disabled. Despite the problems with expressive language in past years, these two subjects more than doubled (one quadrupled) their word rate per minute and showed a high level of word accuracy.

Although the small number of students used in this study causes one to hesitate about generalizing, the results of this study remain impressive.

CHAPTER V

Conclusions, and Implications

Conclusions

The Neurological Impress Method has proven to be an effective intervention to increase fluency and build self-confidence for the four subjects involved in this study. All subjects showed at least a doubling of word rate per minute, while one student showed a quadrupling of her word rate score per minute. This same student's graph also revealed a strong trend of change for word accuracy per minute, while the remaining subjects maintained a high level of word accuracy per minute (in excess of 90%).

Many researchers have addressed the psychological affective component of NIM (Arena, 1990; Heckelman, 1986, Layton & Koenig, 1998; McAllister, 1989). The students in this study, according to the classroom teacher and the observations of this researcher, display a greater confidence while reading, are more willing to take risks when stuck on a word they don't know, are choosing more difficult books (including chapter books), and are more interested in reading independently at home and in the classroom. The classroom teacher and this researcher have observed that the students' desire to read has transferred to other subject areas while in the classroom. Students are now more likely to volunteer to read during Social Studies, Health, and in other subjects that involve reading throughout the day. Enthusiasm and motivation to be better readers remains high. In personal interviews with

the researcher, students have shared that they feel they are much better readers now whereas before they saw themselves as basically nonreaders.

Discussion

Slavin & Madden (1989) have noted that when children experience reading failure in the early grades, early intervention with intensive one-to-one help works the best. The four subjects in this study have each had over 40 NIM sessions with the researcher in a one-to-one format. The researcher was also all four subjects' special education teacher so there was a comfort level present from the beginning.

Fluency training became the goal for this group of fourth graders because they had never before had access to fluency building techniques. Previous researchers have noted that students cannot focus on the real goal of reading, which is to read for meaning, until they can read fluently (Samuels, Schermer, & Reinking, 1992). According to Samuels et al. (1992), beginning readers first focus their attention on decoding then move on to being able to focus on comprehension. By doing these tasks one at a time the reader avoids overtaxing his or her attention resources. The beginners' reading is slow and difficult precisely because the focus of their attention is to each individual word or even the individual letter. This places a heavy load on memory. With repeated exposures to words, the length of the visual unit increases. Once students begin to expend less energy on the decoding, the more

their attention can be diverted to meaning (Henk, 1981; Layton & Koenig, 1998; May, 1990; Samuels et al., 1992).

For the students involved in this study, previous teachers and special educators heavily emphasized a skill-streaming approach to remediate these children and they were taken out of the regular classroom to do so. Perhaps the students' low scores on the DRP test at the end of third grade may have reflected, although not necessarily have been caused by, past teachers' heavy emphasis on words rather than meaning. In addition, Mosenthal (1984) stated," The most important context influencing reading comprehension in classroom lessons may be the interaction between the teacher and the students" (p. 17). Despite intensive small group instruction and individualized help, these subjects made only nominal gains during the first four years of reading instruction.

Coming into grade four, all subjects were far below grade level according to standardized testing and teacher report. It was recommended by their third grade teachers (special education and consult team) that each of the students be placed in direct instruction for reading. As mentioned earlier, all students saw themselves as nonreaders. Each specifically mentioned to the researcher a desire to be able to read better. The motivation was there to be a better reader, but each one voiced concerns that they might not learn to "read as well as other kids", as one subject stated. After years of remedial reading, (from Title I Services and Special Education programs) these students still lacked the confidence that they could be a better readers. The motivation

piece is critical. As Henk (1981) stated "the child's attitude may very well be the single most important determinant of reading success" (p.13).

During the initial NIM sessions, the subjects were clearly relieved to realize that they wouldn't be reading alone. The researcher carefully explained how these sessions would be different from what they were used to, but they would be able to see the progress they would make on line graphs. This effectively eliminated any stress the children may have felt. This ties into Heckleman's belief that a non-threatening environment is a must to better utilize neural pathways.

At first, as Henk, Helfeldt, and Platt (1986) mentioned, the initial NIM sessions sounded like mumbling as the students struggled to keep up. However, as the sessions progressed, each subject assumed the vocal lead quite naturally, as the researcher's voice consciously reduced in volume. The finger sweeping remained difficult for both Bob and Matt, however. It appeared that they were concentrating so hard, that they found it difficult to remember to sweep at the same time. The researcher placed her hand on top of the subject's wrist and with gentle pressure guided the finger along the words as they were being spoken.

The subjects visibly gained confidence in subsequent sessions of NIM, as they started to read with more confidence. The transition to the students taking the vocal lead seemed to be a natural one, as each one began to read louder and with expression. The visual displays of their progress via line graphs, seemed to be a great motivation for them session after session. As Samuels, Schermer, and Reinking (1992)

indicated, this form of assessment enables both the teacher and the student to see progress and provides students with a visual display of how they are doing. They are then more likely to summon the necessary strength to improve. Although they knew they were being tested after every 10 sessions, they would often ask , "When can I be tested again?" They would immediately go back to the classroom and ask their regular education teacher if they could share how many words they were up to per minute. This became an occasion for the class to celebrate as progress was made. This was an enormous confidence booster for them. In the past, these students knew only that they couldn't stay with their classmates during reading sessions because they needed extra help and thus were not real "readers". Juel (1988) found that early poor decoders not only read considerably less than average or good decoders but tended to express a real dislike of both reading and the failure of being able to learn to read in school. In NIM sessions, these students often expressed surprise at how many books were read from week to week. All parents of the subjects involved noted that independent reading has increased at home and their children are reading with expression and confidence. Helfeldt and Henk (1985) indicated that when subjects learn smoother reading patterns, this fluidity often transfers to other reading tasks, resulting in a general improvement in reading.

It should also be noted that the students involved in the NIM sessions began to spontaneously share their predictions or observations

about the books they were reading, on their own, without prompting. It appeared this spontaneous sharing and predicting indicated their pleasure in the literature and also showed a high level of comprehension of what they were reading. At no time were there corrections made for errors, a new experience in remedial reading for them. Sessions were enjoyable, pleasant, and non-threatening for NIM sessions as recommended by Heckelman (1986) and Arena (1980). Perhaps this is why students would race each other down the hall to see who would get to NIM sessions first.

Implications for the Classroom

Both Allington (1983) and Rasinski (1989) have noted that fluency training is often a neglected area in both regular and remedial reading instruction. They see this lack as a major reason why many students experience problems in reading during the elementary grades. Why is fluency training important in the classroom? Samuels, Schermer, and Reinking (1992) believe that students cannot begin to focus on comprehension until they are fluent in reading. Fluent reading is characterized by a lack of difficulty with word identification or comprehension, and the student will read with expression. These same researchers also feel that since speed is the preferred indicator of automaticity, (a term used interchangeably with fluency in the literature), there must be a focus on fluency in remedial programs. Even when students become 100% accurate in word recognition, reading speed can continue to increase with practice. Accuracy in recognition is not

sufficient for fluent reading. The goal must be to move beyond accuracy to automaticity. Since there is a high possibility that poor decoders in first grade will be poor readers in fourth grade, educators must do all they can to help students by using techniques that have proven their utility through repeated research studies. The Neurological Impress Method has certainly been well researched over the years with a number of disabled readers since it was first introduced as a fluency building technique. It provides intensive one-to-one tutoring which is very effective for at-risk students (Slavin & Madden, 1989). The short sessions for each student (usually 10 minutes) prevents the voice and position fatigue seen in longer sessions of NIM and which were noted by Cook, Nolan, and Zanotti (1980). Because students are reading with the instructor on a regular basis, they receive large amounts of oral reading practice which positively impacts fluency and they tend to read more books than they would be able to read on their own.

In many classroom there may be some students with auditory perception problems as well as those with learning disabilities. Even though the Neurological Impress Method relies heavily on auditory input as well as visual, Cook et al. (1980) found it a useful technique for increasing word recognition as well as improving oral and silent reading with students who have this difficulty. Fluency training can easily be used together with other skills-based programs used by remedial teachers (Henk, Helfeldt, & Platt, 1986).

The NIM has proven itself to be a highly adaptable technique that can be used to meet the needs of a diverse classroom. It is uncomplicated to use, a technique easy to train others to use and thus is compatible with inclusive classroom practices where diversity in teaching techniques is necessary but where staffing may be inadequate to address all students' needs.

Implications for Future Research

This study brought up many questions for further study. Because this researcher is involved in a looping situation with her fourth grade inclusion classroom, this study could be continued on for these students as fifth graders. Even though for the purposes of this study, the research has ended, the NIM sessions with this group of students will continue on until the end of the school year, in June. Because the classroom these students are from is made up of a number of ability levels, it would be interesting to see what would happen if these same students continued their NIM sessions through trained peer tutors from within the same class (who would be lead readers). This looping format provides the ideal situation to monitor these children's reading skills for another year.

The results of many research studies have made it clear that fluency training is a neglected area of remedial reading. Perhaps if fluency training methods such as NIM, or an adaptation of NIM were implemented in the regular classroom in the primary grades (perhaps first or second grade), as a regular part of reading instruction, would

there be such a large number of children with reading difficulties at the intermediate level? If children heard more fluent oral reading throughout the elementary years, perhaps it would make a difference in children's' overall reading abilities. This would be a very interesting study to conduct.

During this study, the researcher worked with students for 10 minute sessions per day for 40 sessions . It would be an interesting study to determine if just five minutes a day for 40 sessions would be enough to show improvement in word recognition and word rate per minute for targeted students.

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Appendix A

The Neurological Impress Method Guidelines

(Strong & Traynelis-Yurek, 1990, p.28)

1. The student reads aloud simultaneously with the instructor.

2. The text is read with normal phrasing and pace.

3. No attention is given to errors and miscues.

4. The main objective is to cover as much material as possible in 10 minutes or before tiredness sets in.

5. Initially the teacher assumes the vocal lead but gradually lets the student's voice take control as confidence levels grow.

6. The students sits slightly in front of and to the left of the instructor. The instructor reads into the student's right ear. The book is held jointly.

7. The instructor slides his or her finger under the lines of text as they are being read. The finger should be under each word as it is spoken.

8. Gradually, the student uses his or her own finger to slide under each word as it is spoken.

9. No corrections are made, although students may spontaneously share observations or comments about the book.

10. Initially, instruction is begun at the student's independent level with high interest materials selected by the child. More difficult material can later be selected as the student grows more confident with the procedure and the brisk reading pace.