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The Neurological Impress Method & Its Effects on the Reading Attitude & Achievement of Learning Disabled Students

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Anthony John

1986
THE NEUROLOGICAL IMPRESS METHOD AND ITS EFFECTS
ON THE READING ATTITUDE AND ACHIEVEMENT
OF LEARNING DISABLED STUDENTS

A Project
Presented to
the Faculty of the Department of Elementary Education
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Specialist in Elementary Education

by
Anthony John Kunitsky
July 1986
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THE NEUROLOGICAL IMPRESS METHOD AND ITS EFFECTS
ON THE READING ATTITUDE AND ACHIEVEMENT
OF LEARNING DISABLED STUDENTS

Recommended July 10, 1986
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The Neurological Impress Method is a system of unison reading in which the student and the instructor read orally together. The theory underlying the method is that the auditory feedback from the reader's own voice and from someone else's voice accurately reading the same material establishes a new learning process.

The effectiveness of the impress method with students identified as having a specific learning disability was examined. The subjects were 16 sixth through ninth graders, ranging in age from 13 to 16, and assigned to a special school setting. Each student had been receiving special education services for at least two years and was reading at least two years below grade level as indicated by a standardized reading achievement test. The experimental group received tutoring in the impress method 15 minutes daily, four days a week, to comprise a total of 10 hours of training in the technique. Pre- and posttesting were done to assess reading instructional levels and attitudes toward reading. Scores in both achievement and attitude were compiled, and a statistical analysis was performed that determined the results to be significant.
It was concluded that the Neurological Impress Method is an effective remedial procedure for use with learning disabled students. The procedure produced significant results which were manifested by improvements in reading achievement and development of improved attitudes toward the reading process.
CHAPTER I

INTRODUCTION

"Reading is the meaningful interpretation of printed or written verbal symbols." Though brief and simplistic, this definition proposed by Harris and Sipay (1986, p. 8) encapsulates the essence of a very complex perceptual process. Most children learn to read, others hardly learn to read at all, and still others learn to read only after extreme effort. Consequently, the reading process has been microscopically scrutinized, dissected, and subjected to the most complex analysis by the most precise authorities representing the entire gamut of academic disciplines. The products of these endeavors are often as varied as the individuals who proposed them.

A synthesis of the multiplicity of proposals would suggest, however, that there is no one correct method of teaching reading or remediating deficits in reading for all students, or even for the majority of students. It is particularly necessary therefore for those students who are not affected by the general barrage of beginning reading instruction to be provided with viable options in their
remedial programs rather than continuing volleys of approaches that may miss their mark.

Background of the Problem

Generally, when students perform below their expected capacities in reading, they are referred to specialists for additional work. These traditional remedial reading approaches stress mastery of specific skills; consequently students who fail in classroom reading programs based on specific skills are not likely to respond favorably to similar remedial programs (Anderson, 1981). More often than not, this supplemental aid consists of an intensified synthetic approach to word attack. Here the emphasis is placed on blending sounds into whole words while mastering grapheme-phoneme correspondences. This direct teaching is intended to provide the student with a comprehensive arsenal of rules and generalizations.

While some children benefit greatly from this conventional type of remediation, others experience a further compounding of the initial difficulty. Many reading disabled students already read in a laboriously slow, word-by-word style. By overly emphasizing phonic rule learning, educators may unintentionally cause certain students to become increasingly overanalytical and, as a result, their reading fluency becomes even more disrupted. Readers are enticed into switching from the content of the message to deciding upon the
appropriate rule, verbally rehearsing it, applying it, and judging its usefulness. These cognitive processes consume large reserves of mental energy—so much so, that little attention and memory remains for understanding whatever is being read (Cunningham, 1979). In this sense, word-by-word reading is the outcome of directing a disproportionate amount of attention to the surface levels of language. Students inevitably see the graphic symbols as ends in themselves, rather than as a means to understanding the intended message. Consequently, they do not avail themselves of the more productive and meaningful cueing systems of syntax and semantics. What begins as a well-intended effort to make a student's reading more fluent may actually serve to restrict reading fluency and promote comprehension problems.

Statement of the Problem

The problem of concern in this project will be to investigate the effectiveness of the Neurological Impress Method (NIM) as a remedial reading technique for children classified as learning disabled. The investigation will be done by comparing any gains or changes made in the reading achievement (instructional reading levels) and attitudes toward reading of subjects in a group receiving instruction utilizing the NIM format and a group receiving a more traditional remedial application. Comparisons will be made
utilizing scores obtained from the Diagnostic Reading Scales (Spache, 1981) and the Estes Attitude Scales (Estes, Johnstons, Richard & Roettger, 1981).

Significance of the Study

The importance of the proposed study lies in the writer's attempt to circumvent the aforementioned problematic tendencies students display when participating in conventional forms of reading remediation. The experimental aspect of the project will be focused on encouraging students to interact with the processing strategies of efficient readers within a pressure-free, natural language context, as is present in the Neurological Impress Method. The NIM is a perceptual conditioning approach to oral reading in which the student and the teacher read aloud, simultaneously, at a rapid rate. Its purpose is to reinforce the match between audition and vision in the reading process.

While the majority of studies employing the NIM as a remedial technique are favorable to the approach, its application to children with learning disabilities is found in only a few sources (Cook, Nolan, & Zanotti, 1980; Lorenz & Vockell, 1979). Although these studies involved similar samples of learning disabled students, they produced conflicting results. Using a similar sample of students, the present researcher will attempt to clarify the discrepancy in these earlier findings. The neglect in employing the NIM with
learning disabled students and the ambiguity of its effectiveness is difficult to understand in that the multisensory approach of the procedure would seem to lend itself to an application with the learning disabled student. To clearly understand the significance of such an application, one must first look at how a learning disabled student processes information.

The learning disabled student lacks organization within himself, particularly in the manner in which he takes in information, processes it and makes a response. Problems of disorganization can be present in a high level task such as reading or a low level task such as balancing on a board. If there are deficits in higher level tasks then there also tends to be some lower level deficits. When there are deficits, the learning disabled student must engage in cognitive overload in order to complete a task, meaning that he/she must think about the task before responding. Thus, if requested to recite the first three letters of the alphabet, the student would have to pause and think rather than answering automatically. This inefficient processing method is of particular concern when a student is engaged in reading and needs to stop and think about letter identification (Early, 1976).

One method to assist in improving the processing of the learning disabled child involves a multisensory learning approach. If any of the learning processes are not functioning
accurately, pairing of modalities insures that those least efficient ones will still be utilized and gradually strengthened by the reinforcement of accurate information from the stronger modalities. Studies show that students of all ages, even those not having learning impairments, progress more rapidly through multisensory learning (Maley, 1982). The NIM approach to remedial reading employs this multi-modality technique through the simple act of unison reading. Perceptual conditioning should be achieved through the immediate feedback provided when words are accurately pronounced. Additionally, auditory cueing will allow the student to pronounce unknown words, while the synchronization of visual and auditory perceptual input further enhances the perceptual conditioning process. It is because the learning disabled student may not be able to synchronize his perceptions or coordinate the activities of his modalities that using a multi-modality approach such as the NIM becomes important. By using as many modalities as possible, the least efficient ones are forced to coordinate with the more efficient ones, and thus develop simultaneously with the stronger modalities. The cardinal significance of this project then lies in the need for research and programs that are concerned with increasing reading ability, not only in learning disabled students, but the entire low-achieving school population. The Neurological Impress Method may be able to satiate at least a portion of that need.
A teacher survey recently cited by Heathington and Alexander (1984) found that while teachers considered students' attitudes toward reading as important, few devoted any time to fostering positive attitudes, and even fewer were aware that instruments exist that can assess children's attitudes toward reading. It should be noted that students who demonstrate reading deficits often possess negative attitudes toward reading that are directly proportional to the derogation they feel over their reading inadequacies (Shuman, 1979). Their shame may manifest itself in various ways—apathy, defensiveness, and lack of cooperation. Such students have, characteristically, learned not to take risks within the academic setting because too often their risks have not brought them successes. Instead, their formative school years have been filled with disappointments, failures and ridicule leaving them feeling angry, defeated, and prejudiced to all reading programs. If anything is to succeed in helping them to cope with and overcome their deficits, it must be presented in a nonthreatening and nonjudgemental context.

Even in studies where the NIM failed to be judged superior to other remediating techniques, it was still noted to have had a positive effect on the participant's attitudes toward reading (Lorenz & Vockell, 1979; Strong & Traynelis-Yurek, 1983). In this study, the success of the NIM's effectiveness will not be judged solely on the students'
improvements. The value in being able to read is greatly diminished if one seldom engages in the act because it is perceived as an unpleasant task. Rowell (1967) very aptly summarized the situation by stating, "If improvement in reading skills takes place without a concurrent improvement in attitude toward reading, the progress is only partial and at best, may be of short duration" (p. 3). The second significant point of this project will be to assess attitude-changes toward reading exhibited by any of the students, whether they've participated in the NIM or have received the more traditional remedial procedures.

The NIM is based on the principle that increased reading fluency can be achieved through practice and that smoother reading patterns can transfer to other reading tasks and result in a general improvement in reading performance and attitude. This generalized state of improved reading has been shown by most research to expand into the more fluent pace of the reading, because it allows the student to focus more of his attention on the thought processes involved in comprehension rather than investing a disproportionate degree of effort in the analysis of single words. More specifically the text itself should be more understandable if the reader can concentrate on delineating sentences into meaningful phrases and clauses rather than devoting so much time and thought to individual words.

The NIM, by providing the opportunity for rapid improvements
in reading fluency and subsequent reading skills, as well as improved attitudes toward reading, may hold considerable promise for learning disabled pupils merely because of the simplicity of its application.

Limitations and Delimitations

The individualized nature of the NIM, makes it feasible for only eight students to be tutored with the impress method, while a corresponding matched set of subjects participate in more traditional remedial approaches. The small samples will be drawn from a specific special school setting, that consists of students ages 12-16, identified as having a learning disability, and of low socioeconomic status (SES). Two criteria are used to support the subjective determination of SES: (a) the participation of 95% of the students in a free/reduced lunch program, and (b) the inclusion of 90% of the students' families in some type of governmental financial aid program, predominately--aid to dependent children.

Organization of the Study

The results from a majority of the completed studies indicate that the NIM is an affective method of reading instruction with selected remedial populations. Studies utilizing NIM techniques have been conducted with as few as one subject (Miller, 1969) to ones containing as many as 60 subjects in
which two control groups were utilized (Langford, Slade, & Barnett, 1974). The individualization and standardization of the NIM procedures, however, have limited most researchers to experimental groups of 8 to 12 students, with a corresponding number of participants in a control group. It is within these limitations that the present study will be conducted in an attempt to replicate the accuracies of previous procedures while eliminating inconsistencies of past research.

All students participating in the study will be pretested and posttested to measure reading achievement and reading attitude. The project provides 10 hours of the NIM procedure for each participant, extending over a period of 10-11 weeks. Each participating student would attend a 15 minute session, four days a week. The present study, therefore, was undertaken to examine the effectiveness of the NIM for learning disabled pupils. Stated more formally the following two questions shall be examined:

1. Will the use of the NIM affect reading fluency and subsequent reading achievement as measured by the Diagnostic Reading Scales (Spache, 1981) for learning disabled students?

2. Does the method promote a change in attitude toward reading as can be determined by the Estes Attitude Scales (Estes et al., 1981) among learning disabled students?
The primary direction of this initial chapter was to provide an overview of the Neurological Impress Method and its central role in the development of this project. It is on this foundation of understanding that Chapter II will be built to explore the history of the NIM, research done on it, as well as the importance of attitudes and attitude assessment in reading. Chapter III will be devoted to the actual procedures implemented in the present study—the research design, materials, and method of instruction. Chapter IV will detail an analysis of the results of the study. The fifth and final chapter will provide an evaluation and discussion of the end product, providing possible recommendations for adaptations of the method or for future research.
CHAPTER II

REVIEW OF RELATED LITERATURE

The Neurological Impress Method is one of the most convenient and inexpensive methods in remedial reading instruction that effect fluency. It is a unison reading procedure that is especially suitable for intermediate, junior high, and senior high remedial readers, and for those who have not profited from intensive phonics instruction. The procedure creates a feedback system that involves hearing, seeing, and speaking words together in a reconditioning of reading patterns (Gardner, 1965). These three modes of learning--audition, vision, and speech--combine to form the automatic mechanism of reading fluency.

This instinctive reading response is a direct result of the synchronous participation of student and teacher. Reading simultaneously with the teacher removes the necessity for the student to try to recall certain sight words, sound out each word separately, or repeat parts of sentences in order to achieve comprehension. While these types of decoding techniques are typically responsible for deficits in reading fluency, the NIM allows no opportunity for these shortcomings.
The simultaneous reading establishes a smooth, fluent reading pattern, that eliminates the apprehension a student usually experiences when being unable to read automatically.

History

In 1952 R.G. Heckelman formalized the procedures for the impress method. Despite the simplicity of the method, he found that after only 7 to 12 hours of NIM instructions, his students began to demonstrate notable improvement in reading achievement (Heckelmen, 1966, 1969). Long before this documentation of the NIM technique, and before the inception of formalized reading programs, or the establishment of public education, children were learning to read in a manner very similar to the impress approach. Looking over a parent's shoulder or sitting on a parent's lap, children were exposed to stories from the Bible or some other treasured work. Inevitably as children became familiar with particular segments of text, their attempts at vocalizing these passages as their parents read them established the foundation for the NIM. Spache (1976) found that a form of simultaneous reading very similar to the NIM may have been transplanted from the home to the Dame Schools of England and early colonial America. Cunningham (1979) likened the NIM experience to belonging to a church or club and being unable to remember a creed or song completely and precisely while attempting its recitation alone. A much more comfortable
situation was created when someone else read, allowing individuals whose memory may have failed them to fall a fraction of a word behind the teacher. A situation very similar to this is created when the NIM is employed.

As education became more formal, particularly in this century, these primarily parent-directed efforts at encouraging reading were discouraged (Hoskisson, 1979). It was felt that however unintentional the exposure to reading at home would only confuse the child when he was exposed to the more formal methods of reading instruction at school. The first grade teachers were assigned the responsibility of teaching all students who passed through the system the art of reading. Naturally not all students learned to read, and it did not take long for educational theorists to locate the problem—the parents. Children were not being prepared properly at home to accommodate the reading instruction of the classroom. Thus the pendulum swung back and parents and preschools were encouraged to assist children in the development of reading readiness skills.

There seemed no better place for one to become familiar with reading than the environment where one learned to speak. Hoskisson (1975, 1979), while advocating early reading assistance at home, likened the setting to one inherent in the NIM. He stated that if students are "provided with the full, rich context of language while learning to read, they will have more opportunity to abstract the regularities of
the orthography, and to generalize many of the phoneme-
grapheme correspondences that they must now piece together
from the bits and pieces of language provided in most
beginning reading programs" (1979, p. 298). This type
of assisted home reading, a precursor of the NIM, tapped into
the generalizing power of children enabling many to overcome
the phonological encumberances of their prescribed reading
program, and to learn to read in spite of them.

Recently, as research on the issue has increased,
many programs have been developed to involve parents in
their children's education and to utilize techniques
similar to the NIM in the home (Burgess, 1982; Lautenschlager
factor of these programs is that children are encouraged
to bring to reading their ability as language constructionists
that they should have developed in acquiring speech. In
other words children are guided to solving the problems of
learning to read in much the same manner that they overcame
the problems of learning to speak. Hoskisson (1979)
summarized the process by pointing out that "children
abstract from speech the set of rules that enable them to
operate the spoken language. In like manner they must
abstract from the written language the structures and
operations that will enable them to become fluent readers"
(p. 299). While Hoskisson's comments pertained to a program
that was intended to be implemented in the home, it very
aptly described the purpose of the NIM whose foundations were established in just such an environment.

It was not until 1952 that the procedure of reading along with children was extended beyond the home and occasional classroom to become designated as the NIM. R.G. Heckelman (1966, 1969), inspired by a technique of direct language feedback which had proved successful when used with stutterers, hypothesized that a similar process could be initiated in a reading situation resulting in a successful neurological change. With the stutterer it was found that when his own voice was redirected back to his ear, the stuttering stopped. In adapting this method to reading, Heckelman further hypothesized that it need not be the reader's own voice that is directed to his ear but the voice of another individual reading the same material at the same time. The accurate model of reading should help to establish a new learning process that should suppress the older, less effective process. In this manner the NIM would become part of an audio-neural conditioning process that inhibited inefficient reading strategies and replaced them with more productive ones.

Heckelman (1969) first documented implementation of the NIM with an adolescent female client who had extreme difficulty in learning to read. She was a ninth grader of normal intelligence but was reading at a third-grade level in "a stumbling, halting fashion that could hardly be
identified as reading" (p. 278). After a series of 12 one hour sessions that spanned a three month period, the subject achieved a three-grade-level improvement in her total reading achievement. Subsequent to this case, Heckelman reported that all of the remedial students he saw were able to achieve similar gains not only in reading achievement but also in reading attitude. Students were reading more and being more vocal about their enjoyment of the process.

In examining the history of the NIM, its psychological connections should not be neglected. From a psychological perspective, reading is seen as involving partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As this partial information is processed, tentative decisions are made to be confirmed, rejected, or refined as reading progresses (Goodman, 1967).

Particularly for the remedial reader, reading can prove to be an extremely overwhelming and complex process. The remedial reader must learn to select the most productive and economical cues available from an arbitrary set of abstract graphic symbols. From these informational cues, he must synthesize and extract the meaning. Some researchers (Smith, 1978; Tovey, 1976) feel that this type of perceptual learning is difficult to achieve through conventional instruction. The distinctive features of letters, words, syntax, and semantic categories often defy verbal explanation.
Instead, they view reading as a skill that is better learned in the manner of skills such as cooking, swimming or driving. These abilities are attained implicitly through guided observation and practice. Inevitably there are some specialized exercises that one can undertake to overcome particular difficulties in learning to read, as is the case with the previously mentioned skills. When it comes to the actual internalization of the ability, however, there is no substitute for engaging in the activity itself.

The promotion of perceptual awareness necessitated by such an approach to learning is clearly evident in the observational learning that occurs within the natural language context of the NIM. The emphasis is placed on having someone perform the reading task so that the learner can infer how it is done properly. The student is given more credit for adaptive reasoning. According to Gibson and Levin (1978), the reading process, despite its built-in complexities, is still amenable to the observational learning, modeling paradigms, and resultant perceptual learning inherent in the NIM.

From a historical standpoint activities similar to the NIM have probably been used since there were individuals who knew how to read. The informality of its implementation has not detracted from its educational longevity, nor its psychological soundness. One does not have to zealously examine the literature on reading to find substantial
justification for its application from both an educational and psychological perspective. The NIM has provided a viable alternative, in a form that has been found to be compatible with the language processing system, for certain students who have experienced difficulties in acquiring certain of the basic skills in reading (Arnold, 1977).

Research on the Impress Method

The research segment of the chapter will expand on the foundations of the NIM as were established in the previous section by reviewing the published studies and articles that have investigated the NIM and its implementation.

It was ten years after Heckelman's initial application of the NIM with an adolescent girl in his psychology clinic that the first formal experiment with the impress method was initiated. In the spring of 1962, Heckelman had the opportunity to discuss the reading method with a number of educators from Merced County, California. These individuals were so impressed with his demonstration that they, along with Heckelman, initiated the first controlled experiment with the NIM so that results could be obtained and evaluated as objectively as possible. Twenty-four students in grades six through ten, reading three years or more below grade placement and expectancy, were each given a total of seven and a half hours of instruction with the impress method. The mean gain in reading comprehension as measured by the
Gilmore Oral Reading Test was 1.0 grade levels. While not all students participating in this study made substantial gains in reading proficiency, it was determined that the gains made were not the result of chance and were found to be significant at both the .001 and .005 percent levels (Heckelman, 1969).

In 1963, Charles Gardner, who had been a psychologist and statistician on Heckelman's Merced County experiment, attempted to replicate the results in a pilot study in the Sonoma County, California school system. With six students, he used the impress method, 10 minutes daily, over a six week period, to total five hours of NIM exposure. The students participating showed a mean gain of 1.6 years in reading achievement on an oral reading test (Heckelman, 1966).

Neither of the pilot studies by Heckelman or Gardner, employed control groups in their research. It was not until 1965 that Gardner employed a classic experimental design that contained both control and experimental groups matched as nearly as possible for sex, IQ, chronological age, and grade placement. Involved in the study were 49 students who had been identified as reading at least two years below chronological age placement and were in grades five through eight. Twenty of the students were selected as the experimental group, 20 were considered control, and nine were considered prime control. The
experimental group received five hours of individual instruction (10 minutes daily) in the impress method, while a control group received the same amount of individual instruction in the same increments but in more conventional reading techniques. A prime control group received no special instruction but were merely administered the various tests. At the end of the six weeks the experimental group showed a gain of 3.2 months, the control group a gain of .2 months, and the prime control group a loss of .2 months in oral reading. Statistically Gardner (1965) determined that these scores could not occur by mere chance, and was able to conclude that the NIM was a worthwhile remedial technique for less-than-able readers.

Embrey (1968), Miller (1969), and Kaluger and Kolson (1969) also tried to replicate the success of Heckelman's earlier experiment, but on a much smaller scale due to the personal involvement required by the method. Embrey used elementary school children with reading difficulties, and found significant differences in vocabulary and comprehension scores after employing the NIM for a total of five hours over a period of eight weeks. Miller, using approximately the same time frame, utilized the impress method with only one student who had been unsuccessful in a number of other remedial programs. Over a period of eight weeks the student's reading level was raised more than one half year. Employing the NIM with certain clinic cases Kaluger and Kolson's
results were not as impressive as previous studies. One half of the students who demonstrated expressive difficulties related to reading did, however, demonstrate marked improvement. While not mentioning the success or failure rates as they pertained to other reading deficits, Kaluger and Kolson, did suggest that the NIM would be an asset to disabled readers who exhibit a wide discrepancy between accuracy in oral reading and comprehension.

While it cannot be denied that early studies done in the 60's using the NIM contained an occasional faulty research design (e.g. lack of control groups, experimenter bias), their overall findings remained predominately positive. Arnold (1972, 1977) attempted to rectify any design problems as he strove to lend further credence to the approach through his research. The purpose of his study was to compare the effectiveness of the impress method to another approach to remedial reading, the Language Experience Approach (LEA). Thirty-two remedial reading students were randomly assigned to one of the two treatment groups or to a control group that received no special remediation. In the treatment groups each student received 15 minutes of the assigned experimental procedure (either NIM or LEA), three days a week, for approximately nine weeks. At the end of that period Arnold found no statistically significant differences between the two different groups. In comparison to the control group however, the differences
were more evident. As a result of the seven hours of NIM or LEA, students improved an average of one year in oral reading. Arnold felt these results did not debunk the effectiveness of the NIM, but did imply that in remediating reading problems there may be no one best method. Further he suggested, no methods should be prescribed until an individual's reading problems have been diagnosed. Upon further examination of his results, he determined that the NIM would probably be least effective with students having fundamental reading problems as in basic decoding skills development, and most effective with those exhibiting deficits in oral reading accuracy and fluency. This notion is partially supported by Kaluger and Kolson (1969) who thought that the NIM would be successful for students with expressive language problems.

About the same time Gawarkiewicz (1972) did a study quite similar to Arnold's, with one exception: she compared the NIM to an intensified phonics method instead of the LEA. At the conclusion of her six week experimental period, it was determined that there was no measurable increase in reading achievement in either the two treatment or control groups. Upon closer scrutiny, the inconclusiveness of her results were found to be due to her own research techniques. In spite of this condition, she was able to affirm the fact that to be effective the impress method would need to be employed with more severely retarded readers, as was the case in Heckelman's original endeavors.
Evidently aware of the drawbacks of the Gawarkiewicz study, subsequent researchers who employed the NIM as it was traditionally intended with remedial readers found more positive results. Langford, Slade, and Barnett (1974) employed the technique of single-subject research quite satisfactorily in assessing the effectiveness of the NIM. Substantial gains were noted for each of the cases they reported on, and the documentation of their treatments made their findings as applicable as those involving larger samples. The standards by which their research was undertaken fall in line with those outlined by Deitz, Cullinan, and Epstein (1983). According to these authors, the single-subject research (to which the NIM lends itself easily) has provided an important exploratory base into the education and management of handicapping conditions as are inherent in severe reading deficits.

Regardless of the success that Langford and his associates had with the impress method in the context of single-subject research, the bulk of published studies involving the NIM continued to utilize the more traditionally acceptable larger samples. Gibbs and Proctor (1977) replicated the results of earlier studies that found the impress method to have a positive effect on general reading achievement. The subjects of their experiment were 39 fourth, fifth, and sixth graders of average intelligence who tested at least one year below grade level. After eight
weeks those students receiving tutoring in the NIM had raised their reading grade level by a little over one half year. Additionally, it was noted that these students were not only very intent on working during the NIM sessions but were also more eager to participate in regular classroom reading situations.

Studies that specifically designate their samples to be comprised of learning disabled students have not been consistent in their findings regarding the effectiveness of the NIM. Lorenz and Vockell (1979) used 44 second through fifth grade learning disabled students reading from one half to three years below grade level. Half the students were tutored in the NIM for 10 minutes a session (for a total of six and one half hours), while the other half were taught by more traditional remedial reading techniques. An analysis of the results failed to demonstrate that the impress method helped learning disabled pupils develop better reading skills.

Cook, Nolan, and Zanotti (1976, 1980), however, found a marked improvement in grade equivalencies of students in an experimental group receiving tutoring in the NIM as opposed to a similar control group that did not. These students were identified as learning disabled and in fact had recognizable auditory perception impairments similar to those students who participated in Lorenz and Vockell's study. Stinner (1979) attained similar positive results
employing the technique with fourth grade learning disability students. Unique to Stinner's study was that the researcher trained sixth graders as tutors in the NIM technique. It was found that there was no difference in the gains between learning disability students reading with the sixth graders and another group reading with the researcher.

While an ample but by no means overwhelming amount of NIM research has been completed, it is not a particularly simple task to synthesize those results and formulate a conclusive statement on the effectiveness of the approach. Part of this difficulty stems from the lack of standardization as to what the different researchers were trying to achieve, have their subjects achieve, and the means by which they measured such achievement. Undoubtedly semantics plays a role in this dilemma, for it may be inappropriate to assume that a study showing an improvement in "decoding skills" is a true replication of a study that shows an increase in "verbal fluency." As different studies use different tests to evaluate the effectiveness of the same procedure, and as different studies employ different terminology to describe the same behaviors and/or results, the fallibility of any specific, definitive composite of the research is obvious. Instead a statement on the general effectiveness of the NIM should be more appropriate. Hence, the research has indicated that the impress method which emphasizes rapid decoding may be particularly well suited for older word-
by-word readers who need modeling in fluent discourse. The method itself has been responsible for better controlled individual pacing, greater motivation, immediate personal reinforcement, and enhanced monitoring of performance.

Attitudes toward Reading

In one of the most recent studies employing the impress method, Strong and Traynelis-Yurek (1983), took the opportunity to pre- and posttest for any attitudinal changes on the students' part toward reading. The student attitude survey showed that after the program 83.3% of the experimental group who received instruction with the NIM felt they read better and 100% said they enjoyed reading more. The importance of this measurement lies in the emphasis it places on considering reading attitudes as part of the criterion in the total evaluation of a reading program, rather than whether it accords more credibility to the NIM. Measuring a technique's effectiveness on the students' ability scores alone is limited. A more balanced and accurate perception of a method's utilization should be achieved by investigating skills improvement together with attitude improvement.

Historically, reading research has concentrated on the acquisition and measurement of reading abilities and on the improvement of reading instruction. If any area has been neglected it has been in the development and
measurement of students' attitudes toward reading (Roettger, Szymczuk, & Millard, 1979). Farr and Carey (1986) illustrated this point when they suggested that reading assessment has not changed significantly in the past 50 years. They support an earlier position taken by Estes (1972) in which he criticized commercial test publishers for not having assigned comparable importance to reading attitudes as had been assigned to other reading skills in test batteries. The extremely conservative nature of the test producing industry has prohibited any significant change in reading tests, and until recently excluded from their assessments any form of reading attitude survey. While the importance of assessing reading attitudes had never been denied, it was probably the sheer dilemma over whether such attitudes could be accurately measured that precluded their inclusion in reading assessment tools. Needless to say, attitudes are not as quantifiable as are students' word recognition levels. As a direct result of such researchers as Estes (1971), Lewis (1983), Tullock-Rhody and Alexander (1983), techniques to assess attitudes have been developed and teachers are now better able to determine how students feel about reading.

Stott (1973) very aptly described the motivational hazards encountered by a child learning to read. When first exposed to the printed page, the child is usually overawed by the monumental challenge, the nature of which he is not able to comprehend. Stott feels that "except for the fact
that in most cases his culture leaves him no alternative but to face it, he would react as does the average human being to any forbidding and problematic task: he would let well enough alone" (p.382). In certain cultures where such pressure is lacking, and with certain children whose handicaps put them at a distinct disadvantage, the natural tendency is to respond by avoidance.

Since the development of a positive attitude toward reading is so crucial, yet elusive for the "normal" reader, it is naturally much more difficult to instill such values in the remedial reading student whose confidence is already deficient. Often these students possess a very different set of life experiences and their attitudes toward reading have suffered due to several failed attempts to master the process in public school and other remedial settings. Heekelman sees a sort of failure conditioning taking place in school for these students, as the motivating rewards become less and less the older they get. Accompanying this drop in motivation is often increased behavioral and emotional problems (Arena, 1980).

Research results have indicated that normal readers have more positive attitudes toward reading than disabled readers, and that children often attribute their own reading attitude to their reading ability (Lohman, 1983; Ransbury, 1973; Wisneski & Wallbrown, 1983). Since students' attitudes statistically correlated with reading success, it becomes all
the more necessary to provide not only appropriate assessment of those attitudes but activities that foster their enhancement. Remediation of reading deficits, particularly for older students, may be the only method of developing positive feelings toward reading. Since it is desirable to promote positive reading attitudes or at least reduce negative attitudes, then it is necessary to become aware of students' present attitudes.

While a review of the literature prior to the mid 70's regarding attitudinal measurements toward reading has yielded a spartan quantity of articles, the recent research interest in affective measurement has increased significantly. As authors (Deck & Barnette, 1976; Kennedy & Halinski, 1975; Schreiner, 1983) recommend the inclusion of attitudinal assessments in all complete reading diagnoses, and as teachers continue to profess the objective of developing life-long readers, the attitude of the student toward the reading act is brought to the forefront of the reading program. Thus student attitudes are not only of critical importance in the development and utilization of one's normal reading potential, but are more of a vital concern to a remedial program. The students attitude in a remedial situation, may not effect an accurate interpretation of the printed word, but it may affect whether the attempt at that interpretation is ever made.
Summary

Van Jura (1984) refers to the older remedial reading students who do not possess the basic reading skills to function independently enough to carry out simple class assignments as "students at risk." These students lack not only the ability, but also the motivation to read for learning or pleasure. Consequently many achieve below potential, others become frustrated, and a significant number just give up. If they do not drop out of school, many find themselves spending the better part of their school day assigned to remedial or learning disability classrooms. There they participate in reading programs that emphasize the mastering of certain prerequisite skills at the cost of ever being given the opportunity to read fluently. It is for these students that the Neurological Impress Method may hold the most promise. The frustration that has accumulated for these students as a result of years of failure, may be alleviated by the NIM as they become convinced that reading improvement is still possible.

While the NIM enjoys a simplicity in construction, its credibility is supported by both theory and documented research findings. The technological complexity that the impress method does not exhibit, fails to detract from it being a highly appropriate practical strategy for assisting a substantial segment of the students experiencing oral
reading difficulties. Students are asked to become active participants in their learning process, making the method all the more effective at not only improving fluency but attitude.

It appears then that the instructional technique of the impress method and the subsequent procedures followed within the present study, adhere to the standards of a successful reading program as outlined by Winograd and Greenlee (1986). In summarizing their requisites for success they felt that "if we really want to produce fluent readers who like to read, then we must ensure that reading instruction addresses both the skill and will of reading and that reading assessment considers both how well and how often students read" (p.20).
CHAPTER III

PROCEDURE

The fluent reading of text segments is absent from many problem readers' experiences because they may have been subjected to instructional programs that concentrated heavily on the analysis and decoding of individual words, with little or no emphasis placed on the swift, successive processing of words as parts of larger more meaningful units of language. A natural result of this neglect is the creation of a certain proportion of students who after only a few years in school not only read ineffectively but do not like to read. This chapter includes a description of an investigation that studied the effectiveness of the neurological impress method on the reading levels and attitudes of just such a group of students.

Description of the Sample

The students participating in this study were 16 sixth through ninth graders, ranging in age from 13 to 16. All participants had been identified as having a specific learning disability and were assigned to a special school
setting. Each student had been receiving special education services for at least two years and was reading at least two years below grade placement level. In addition to assuring that each student was of average intelligence, the learning disability classification insured the students' reading problems were not the primary result of any visual, hearing, or emotional handicaps or due to environmental, cultural, or economic disadvantage (Kentucky Revised Statute 157.200, Kentucky Department of Education, 1984).

Research and Statistical Design

The design of this experiment employs the classic control and experimental groups that will be matched as closely as possible on the basis of sex, chronological age and grade placement. Eight students will be assigned to an experimental group, with a corresponding eight assigned to the control group. Both groups would be pretested to determine reading instructional levels and attitudes toward reading.

The experimental group will receive tutoring in the impress method 15 minutes daily, fours days a week, to comprise a total of 10 hours of training in the technique. The tutoring will be completed in a maximum of 11 weeks. The students in the control group will continue in their regular remedial program that incorporates more traditional approaches such as language experience, kinesthetic training,
and phonetic analysis. The control group will have precisely the same amount of reading time as does the experimental group. The special school setting insures that each student receives an individualized reading program. This type of program facilitates the incorporation of the NIM procedure into the daily reading activities of the experimental group. It can be done without any consternation or undue curiosity on the participants' parts. The individualization of the overall school program also makes it easy to insure that all students involved receive the same amount of reading instruction with the experimental group having the NIM substituted for certain periods of more conventional remedial techniques.

Upon completion of the 11 week period all subjects will once again be tested to determine whether any changes have occurred in reading instructional level or in reading attitude. The scores will be compiled and a statistical analysis will be performed to determine if there is any significance to the results.

For the purpose of this study, a distinction must be made between large and small sample statistics. This distinction resides in the fact that normal distribution is frequently found to be an appropriate model for use with sampling problems involving large samples. With small samples the distribution of $t$ provides for many statistics a more appropriate model (MacEachron, 1982). The $t$-distribution
is similar to the normal distribution in being symmetrical about a mean of zero, and bell-shaped. But it is flatter (more dispersed) and its dispersion varies according to the size of the sample. The $t$-ratio is defined in the same fashion as statistics obtained from a normal distribution. In other words, it is a deviation divided by a standard deviation; the difference between the means is the deviation, and the standard error of the difference between the means is the standard deviation (Downie & Heath, 1974). It follows that is is not the computation of the work that must change when small samples are used but the interpretation of the results. This is so because this $t$ statistic is not normally distributed when the sample is small. The larger the sample the more nearly the $t$-distribution will approach the normal distribution. As the number of subjects decreases, however, the sampling distribution of $t$ has the extremes of the tails lifted from the base line, allowing for more subjects to be found within the tails of the bell-shaped curve. Thus the need for different sampling distributions for different sample sizes becomes evident.

The current study will utilize the "repeated measures $t$ test" as described by Gravetter and Wallnau (1985) to determine whether there is any accompanying significance to the obtained scores. This test was developed specifically for research that was designed to determine whether a particular treatment had any effect on the behavior of a
set of subjects. The repeated measures $t$ test is also appropriate when two separate but related or matched samples are used. Statistically, the advantage of matched samples is the reduction of error variability due to individual differences.

Results will also be evaluated through application of the Mann-Whitney $U$-test. The calculations for this test require that the individual scores of the two samples be rank-ordered. This nonparametric statistical test is less discriminating in its analysis, and hence will be less sensitive to the results than the $t$-test will be. When applied to small samples it has been found to be equal or superior to its parametric counterparts in terms of statistical efficiency (Gravetter & Wallnau, 1985). The test is often applied in situations in which the two samples are drawn from the same population but different treatments are used on each set. The $U$-test is appropriate for the present study and will serve to augment and support the findings of the $t$-test.

The encompassing objective of the study was to determine whether the reading level of the learning disabled student can be affected by involvement with the impress method, and if such involvement influences the student's attitude toward reading. The problems stated in terms of null hypotheses are (a) the neurological impress method will have no significant effect on the reading level of learning
disabled students who have exhibited marked reading deficits and (b) the neurological impress method will have no significant effect on the attitudes toward reading of learning disabled students who have exhibited reading deficits.

Materials

The reading materials employed with the experimental group were designated as high-interest, remedially oriented books especially suited for learning disabled students. Several series, all published by High Noon Books, were utilized with the experimental group and were made equally available to the control group in activities for which they might have been suited. These series included Tom and Ricky Mystery Series (Wright, 1982), first grade readability; Scoop Doogan Mysteries (Keown, 1984-1985), second grade readability; Perspectives (Mullin, 1982), third-fourth grade readability; and You are the Judge (Lipman & Furniss, 1984), fifth-sixth grade readability. The publisher's designated readability for the books used in this study was verified by applying the readability formula developed by Dale and Chall (1948).

In addition to readability levels, the publisher also recommended certain age levels for which the content and interest level of the works might be appropriate. These, along with the readability designations, were referred to in assigning particular books to particular students.
The four series selected fit exceptionally well into the format of the impress method. They were comprised of one-plot books, with characters that seemed to appeal to reluctant readers. The brevity of the selections enabled them to easily fit into the time frame determined by the NIM. Illustrations were limited and there were no comprehension checks within the pages of the text. This design prevented any unnecessary distractions from the stories. Finally, the "adult-like" appearance of the works, encouraged participation where frequently books featuring elementary formats fail to disguise their remedial content, thus discouraging reluctant readers.

Measurement Devices

The 1981 revised edition of the Diagnostic Reading Scales (DRS) (Spache, 1981) was used as a pre- and posttest measurement device to establish an instructional or fluent oral reading level. The three word recognition lists provided were used to determine entry level on the reading passages for the pretest. The two sets of 11 reading passages insured the uniqueness of reading selections for the posttest.

Though the DRS contains assessments for word analysis and phonetic skills, and procedures to determine independent and potential levels of student performance, its utilization in the present study was limited to determining pre- and
posttest instructional levels. According to Spache (1981) the DRS instructional level designates the approximate grade level of basal or other reading materials in which the student would be placed in the average classroom. This level is indicative of the level and quality of reading that the average classroom teacher would be likely to find acceptable for group or classroom reading practice. Additionally, the testing manual suggests that the highest acceptable oral reading performance which corresponds to the instructional level should be considered appropriate for the selection of materials to be used in individualized or remedial instruction. In the accompanying examiner's manual three major studies are stated to have determined the reliability, validity, and consistency of the DRS. Independent reviews, although not entirely favorable, do consider the DRS as a consistent and accurate diagnostic instrument (Lipa, 1985; Wise, 1985). The technical basis of the DRS, its innate value as a diagnostic tool, and the ease of its administration and interpretation, made it a suitable instrument to determine reading progress for this study.

The second measurement device employed in this study is the Estes Attitude Scale. This instrument, developed by Estes in 1971 for the use of measuring reading attitudes of students in grades 3 through 12, was used as a pre- and posttest to determine whether any attitudinal changes had
taken place in either the control or experimental groups after the 11 week period. The test consists of 20 statements, 8 of them positive and 12 of them negative, directly related to books and reading. Based on a Likert scale, students are asked to express the degree of their agreement or disagreement with the attitude statements. Responses on the five point scale range from "strongly agree" to "strongly disagree". The possible score range is 20-100, with 60 as the mean. A positive attitude ranges from 61-100, while a negative attitude ranges from 20-60. Due to the limited reading ability of the subjects in the study, a permissible modification in the administration of the test was utilized. In order that the scores would more accurately reflect the students true attitudes and not their poor reading ability, the scale statements were read individually to the students.

It has been reported that the original Estes Attitude Scale (Estes, 1971) is "the most efficient paper-and-pencil method for assessing attitudes, and provides the most reliable measure with the least items" (Dryden, 1981, p.6). This original scale was commercially incorporated into a larger assessment that included scales pertaining to four other school subjects (Estes, Johnstone, Richards, & Roettger, 1981). For the purpose of this study, however, the original scale that assessed reading attitude alone was used. In this form the scale has been clearly validated by several studies and found to be a very accurate instrument
in the assessment of reading attitude (Dulin & Chester, 1971; Johnstone, 1974). Vaughan (1980) in reviewing the literature on affective reading scales found that the Estes Attitude Scales was one of the few that had been investigated and determined to have substantiated evidence of construct validity. These factors should insure that the scores obtained from the pre- and posttests are accurate reflections of the students' attitudes toward reading, thus enabling the impress method's effect on those attitudes to be more precisely determined.

Method of Instruction

The basic process of the NIM as was used with the experimental group in this study adhered as closely as possible to the original guidelines developed by Heckelman (1966, 1969). The impress method is simply a system of unison reading whereby the student and instructor read aloud simultaneously at a rapid rate. To begin, the student is positioned slightly in front of and to one side of the teacher as both hold the book. The voice of the teacher is directed into the student's ear so that he sees, hears, and says the words concurrently. The teacher's finger moves beneath the words as they are uttered in unison. Eventually, the student should be able to slide his finger along the line, following the words that are being read aloud. In the beginning, however, the instructor follows the words
they are reading with a smooth, continuous motion of the index finger. He should move his finger under the sentence at precisely the same speed and flow of the verbal reading. Later in the first session the student should be encouraged to take over this activity, but if coordination is difficult, the instructor should impose his finger and continue to slide it along the words until he feels the student is again ready to take over this function. Heckelman emphasizes in this regard that particular attention should be paid to the ends of the line where the finger should be made to move very rapidly back to where the new line begins. It is also at this point that the instructor often needs to make a conscious effort to synchronize his voice with his finger, as the natural tendency is to run the finger ahead of the voice.

At the first meeting the student should be oriented to what will happen and should have the opportunity to ask any questions. The first few NIM sessions should be spent acquainting students with the process by practicing on short familiar passages. The same paragraphs or sentences may be repeated several times until a fluent reading pattern is established. This repetition should be dropped after a few sessions or after the first few minutes of any one session. When beginning to read, the instructor should read louder and slightly faster than the student. Since students typically have not read at this accelerated pace before,
their initial oral reading performances will resemble mumbling. As the impress reading sessions progress and as opportunities present themselves, the instructor lowers his voice or reduces his speed so that there is a slight lag behind the student's reading. When the student falters, he should be reinforced by increased loudness and speed from the instructor. The student and the instructor should alternate between leading and following. After working for several sessions with the students, the teacher should be able to adapt to the system and find very little trouble in gearing to the correct speed for the student.

The approach to the reading is spontaneous, and pauses are permitted only as the text dictates. No preliminary preparation on the reading material is done with the student before beginning to read. The goal for each session is to cover as much material as can be done in the time available, without causing physical discomfort on the part of the student. Heckelman advises the instructor to watch for signs of fatigue, shortness of breath, dry throat or hoarse voice, and if present to allow the student time to recover.

At no time should the instructor attempt to teach phonics or word recognition skills while using this method. The student must not direct his attention toward the mechanics of word structure or meaning. He should simply see, hear, and say the words automatically. No attention should be given any accompanying illustrations or the content of the
material being read. The student is not corrected at any
time and is encouraged to refrain from stopping on difficult
words or returning to words he has already read. If the
student hesitates for an unknown word, he should find the
teacher's place in the passage and continue the simultaneous
reading as soon as possible. By not stopping when the
student falters, the teacher allows for the normal flow of
true reading patterns to develop. This will help the student
to overcome the frustration and distraction of difficult
words, and avoid self-consciousness that is inherent in
making mistakes.

The instructor should avoid repeat reading of the
same material. Instead he should bring the student in
contact with a variety of material. The idea is not to
bore the student, but to introduce different words and
different materials. Initially, the level of reading
material during the first week is somewhat lower than the
student's ability level. Thereafter, it should increase in
complexity up to and above the child's instructional level
on the prettest.

After the unison reading session is completed, the teacher
should not ask the student any question about what he has
read. The student is, however, not discouraged from
volunteering any information about the material he has
read. In this manner the student is positively reinforcing
himself, which indicates interest and comprehension.
The instructor should also comment on the student's success and newly acquired reading fluidity. Any positive motivation and reinforcement that can be given the child will only contribute to the success of his learning to read.

Heckelman feels that the multisensory nature of the NIM works to "impress" the fluid reading patterns of the teacher on the student. It may take some students time to adjust to the NIM largely because of its novel oral reading rate requirements. However, in a short amount of time, most students become so comfortable with the method that they look forward to the sessions. Remedial readers particularly enjoy the procedure because it allows them to deal with more sophisticated material at a pace that resembles mature reading.
CHAPTER IV

RESULTS

Of the eight students within the experimental group receiving impress training, six made measurable progress in reading. In point, reading instructional level was advanced as much as 1.7 grade levels. As shown in Table 1 the mean gain of the experimental group exceeded that of the control group by .6 grade levels. This is most impressive when it is remembered that only 10 hours over an 11 week period were devoted to this instructional program. The highest gain in the control group was a .7 grade level improvement. Four of the eight students in the control group had identical pre- and posttest scores, thus showing no identifiable improvement in reading over the eleven week period. A fifth student recorded a regressive score on the reading posttest—a -.4 grade level difference from his original pretest score.

Although all students did not make substantial gains in reading proficiency, it was found that the gains made by those in the experimental group were significant. The $t$ value obtained fell in the critical region, which in this case was greater than 3.499 or less then -3.499 for a level
of significance of .01. In addition, application of the Mann-Whitney U-test yielded a U value of 11.5 which is significant at the .05 level. The first part of the null hypothesis which stated that the neurological impress method will have no significant effect on the reading level of learning disabled students with marked reading deficits was rejected. In fact it could be concluded that the NIM resulted in a significant increase in the reading instructional level of the learning disabled students in this sample.

Table 1

Mean Grade Level Reading Scores from the Diagnostic Reading Scales

(n = 8 per group)

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>3.0</td>
<td>3.7</td>
<td>+ .7</td>
</tr>
<tr>
<td>Control</td>
<td>3.1</td>
<td>3.2</td>
<td>+ .1</td>
</tr>
</tbody>
</table>

Note. Mean grade placement for both groups was 8.6.

A second purpose of this study was to explore the effects of the impress method on the students' attitudes toward reading. All students in the experimental group registered an improvement in reading attitude as determined by the Estes Attitude Scale. Despite the overall mean gain
for the experimental group (see Table 2), two students still fell below the test mean of 60 which is indicative of a positive attitude.

Table 2

Mean Reading Attitude Scores from the Estes Attitude Scales

(\(n = 8\) per group)

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>54</td>
<td>67.5</td>
<td>+ 13.5</td>
</tr>
<tr>
<td>Control</td>
<td>55.5</td>
<td>56.1</td>
<td>+ .6</td>
</tr>
</tbody>
</table>

Note. On the Estes Attitude Scale the score of 60 is the determining boundary between a positive attitude (61-100) and a negative attitude (20-60).

In examining the range of scores, the upward limit was increased by only six points on the posttest from 74 to 80, while the lower limit was raised from 38 to 55. This improvement merits additional consideration when it is viewed in light of the almost nonexistent alteration between the pre- and posttest range of scores for the control group. On the pretest the control group's range was 46-70 and on the posttest it was 45-70. While four subjects in the control group did exhibit a slight positive change in attitude, two subjects showed no change at all, and two others actually demonstrated a more negative attitude on the posttest.
In spite of the fact that no student could be classified as having a "very positive attitude" toward reading after the study, the improvement in reading attitude made by the experimental group was found to be statistically significant. With the critical region remaining the same as for the reading assessment ($> 3.499$ or $<-3.499$), the $t$ value obtained from examining the attitudinal scores also fell within the area for the same level of significance of .01. When the rank-ordering procedures of the Mann-Whitney $U$-test were applied to the difference scores of the subjects from both samples, the level of significance was refined to the .001 level. These findings enable the second part of the initially stated null hypothesis to also be rejected. In rejecting the premise that the NIM would have no effect on students' attitudes, the study conclusively determined that tutoring in the impress method resulted in a significant improvement in students' attitudes toward reading.

Undoubtedly the results obtained in this study contain some limitations, particularly the generalizability of the findings to other remedial populations who do not enjoy the same type of instructional flexibility. It would seem, however, that the present research does indicate that the NIM is a worthwhile approach to be used with certain problem readers. A point made by Gardner (1965) in his early NIM research, should be considered when examining this study. Namely, it is important to regard the gains made by the
students in the experimental group as being doubly significant, because previously many had regressed in both reading attitudes and reading skills rather than demonstrating measurable improvements in one or both factors.
CHAPTER V

EVALUATION AND DISCUSSION

The Neurological Impress Method as employed in this small study with learning disabled students was proven to be an effective strategy for most of the students in the experimental group. These students not only demonstrated an increase in their reading instructional levels, but they also exhibited a measurable improvement in their attitudes toward reading. Although the findings from this study were positive, they were not as impressive as those reported in earlier research (Cook, Nolan & Zanotti, 1980; Gardner, 1965; Heckelman, 1966, 1969). In addition, the small number of subjects in this study may cause one to hesitate in generalizing to extremes; however, the fact that growth in grade equivalencies favored the experimental group cannot be underestimated.

It is acknowledged that the present study may be accorded a certain amount of criticism. A possible point of confounding might be seen in the fact that the experimental group's reading instruction did not consist exclusively of the impress method. In such a condition it could be theorized that the significant improvement in reading achievement was possible due to a combination of remedial techniques rather
than the result of the NIM alone. The high degree of significance demonstrated by both statistical tests in the analysis of the results, however, repudiates this disparagement of the research. In addition, the NIM by its very nature is designed to be a supplemental approach and not a self-contained reading instructional method. This study was organized and carried out to determine the effectiveness of the impress method in its most natural setting—the classroom. While the chance of interaction between approaches is recognized, it does not detract from the students' impressive gains in both reading attitude and achievement that can only be attributed to the application of the impress techniques.

Conclusions

It can be concluded from the present study that the NIM does produce reading growth in remedial readers, but that certain remedial students may respond better to the NIM than do others. While the most notable improvement in this experiment was an increase of 1.7 grade levels, likewise it should be noted that two subjects in the experimental group registered no progress at all in reading on the final assessment. This discrepancy suggests that all remedial students may not benefit from the approach and that other corrective techniques may be necessary to maximize the learning of certain students. The present
research, however, does not delineate the characteristics of the student for whom the NIM would be most appropriate. It cannot be disputed that most of the learning disabled readers in this study improved their reading through the use of the impress method. Its indiscriminate application to all groups of remedial students cannot be recommended. Reading research has shown that there is no one best method of reading remediation for all cases, and the uniqueness of each student should be the determining factor in selecting the way in which each individual is helped to read. This further highlights a significant factor of earlier research (Arnold, 1977)--the need for an individualized diagnosis for each disabled reader.

The use of the impress method should never be ruled out for students who have failed to respond to other approaches. In cases of severely disabled readers who have experienced little success with more conventional techniques, it may be their only remaining option. Chomsky (1978) recommended just such an option for students of this type who have become resistive to decoding drills. It is probably more useful as a supplementary procedure than a complete remedial method. It is designed to be used as a part of a battery of techniques to teach students to read. It costs nothing, and virtually anyone can be trained to apply the technique in a remedial situation. The advantage is obvious, if paraprofessionals or other readers can
implement the impress method, then teachers can be free for additional instructional tasks.

Applied successfully the NIM will help certain students to advance from the slow cognitive level of reading to a level of automaticity. The decision of whether or not a teacher should choose to use the impress method with a particular student may depend upon the student's individual reading achievement needs and/or his emotional needs. The specific student characteristics, which insure effective implementation, should be examined. It was determined by researchers such as Arnold (1977) and Gawarkiewicz (1972) that students who have improved in reading as a result of the NIM usually share certain common characteristics. These traits include (a) IQ's above 85; (b) a reading disability of at least two or three years below grade placement; (c) previous failure with conventional reading techniques; (d) the absence of fundamental reading problems and presence of problems related more to oral reading accuracy and fluency; and (e) a chronological age of 12 or over. In addition, the amount of teacher preparation time, the teacher-student ratio, and the availability of outside tutors may also contribute to the feasibility of utilizing the impress method with particular students.

Memory (1981), in discussing the neurological impress method, indicated that although research may be inconclusive, informal observations generally recommend the method as one
that builds rapport between the teacher and the student. It has also often appeared to help build students' self-confidence in their reading ability and to develop a more positive attitude toward the reading act. The current study bears this research out as all students exposed to the impress method demonstrated a more positive attitude toward reading at the end of the experimental period. This was even true for students who failed to show measurable improvement in reading. The final attitude scores on the Estes Attitude Scale, actually showed that the two individuals who did not improve in reading, posted a more impressive gain in attitude strength than at least two of the six remaining students who did raise their reading level. This deviation from what might normally be expected, accentuates the problems that may arise when attitude existence or strength is inferred from behaviors or accomplishment alone.

Some researchers (Foettger, Szymczuk & Millard, 1979) have gone so far as to suggest that a strong relationship between attitude toward reading and achievement may not even exist. In spite of classroom "common sense" that would support a cause-and-effect relationship between these two learner variables, there are just too many intervening forces likely to influence the relationship between how a person feels and how he acts. In the case of reading, a student may indicate an enjoyment of reading and yet seldom read because of other, more pressing demands. On the other hand,
a student may have a very strong negative attitude toward reading, yet continue to read because it is one way to please the teacher. In both cases, one would be incorrect in assuming that behavior accurately reflected attitude. Just such as incorrect assumption could have been made with regards to the two students in the present study who spent 11 weeks working in NIM and made no measurable progress. When it comes to the NIM, achievement may not be the sole determinant of attitude improvement. Additional factors that may have affected the students' reading attitudes might include the personableness of the approach, the intenseness of the activities, or the acuteness of the involvement.

The complexity of a student's reading attitudes and the obvious link it has with his personality and reading deficits necessitate the use of an assessment instrument that would coordinate with behavioral observation. The Estes Attitude Scale proved to be an effective instrument in this research where its findings tended to support the informal observations made by the instructor. The complexities of the links among reading attitudes, academic performance, cognitive styles, and socioemotional maturity, have led Henerson, Morris, and Fitz-Gibbon (1978) to call for a multimeasure approach to the assessment of reading attitudes. If students' attitudes are viewed as important factors in learning, then the assessment of those attitudes seems essential. In addition, Lehr (1982) notes, "nothing can be done to improve negative
attitudes or to promote positive ones unless the true nature of a student's attitude is known" (p. 82). With this idea in mind, a formalized measure derived from the Estes Attitude Scale was employed to augment less formal assessments. In this manner an accurate composite of a student's attitudes toward reading was formed--attitudes that are not only crucial to learning to read but may assist in the improvement of the quality of instruction itself.

Heckelman's (1966, 1969) pioneer research on the NIM noted earlier, produced much more imposing results than the present study. A lack of experimental controls and appropriate bias undoubtedly had some impact on his research. Regardless of the minimal scientific rigor sometimes employed, it seems that sufficient findings, including the present ones, support the impress method as a viable approach to remedial reading. Even in cases where the impress method has had little effect on student achievement, it has still been successful at improving student reading attitudes. Granted this alone may not constitute sufficient motivation to initiate the NIM with a remedial student, yet it seems to lend credibility to the importance of reading program objectives containing specific measures designed to affect reading attitudes. Thus, if the NIM's potential to alter both achievement and attitude are to be maximized, it may be necessary to more closely access the reading deficits of each child and prescribe the technique according to individual
needs. It is not a total program, nor is it appropriate for every child, but none the less it has been demonstrated as a considerably effective instructional tool in specific remedial reading situations.

Recommendations

In 1966, when Heckelman had his first article on the impress method published in an established journal, he concluded it with recommendations on how the NIM might be adapted to larger group instruction. His proposal of altering the technique to suit the population or circumstances is one that bears reiteration. The NIM's simplicity quite readily lends itself to a variety of adaptations, adjustments, or additions. For example, the use of taped reading materials, either commercial or teacher-made, has found its way into imitative reading methods that very much resemble the NIM minus the teacher (Cunningham, 1979; Monteith, 1978).

The most publicized of these adaptations was developed by Jordan (1967) and labeled the Prime-O-Tec method. Prime-O-Tec is a combination visual/audio-kinesthetic-motor input to reading instruction. This integration is achieved as the student listens to material recorded on an audio tape, follows the print with his finger, and reads along with the tape. The listening, seeing, saying, and touching must all be in unison if the goal of fluent reading is to be achieved. The underlying theory, as well as the mechanics of the approach,
are almost identical to the NIM, and although the research on it is limited, some evidence has surfaced to suggest it to be a viable remedial approach for older readers (Meyer, 1982).

Additional researchers have been successful in substituting taped readings for the teacher's own personal touch. Hollingsworth (1970, 1978) tried to overcome two of the more limiting factors of the impress method—time consumption and teacher voice fatigue. In his experiment he used equipment that eliminated the need for a teacher to read with each child and allowed for the monitoring of eight children simultaneously. In the latter of his two studies he found a significant difference between the control and experimental groups. The group that received the NIM by way of the taped presentation made one year's growth in reading achievement during one semester, while the control group's mean score change was only .04 of a year's growth. Additionally, it was noted that this improvement was accompanied by an increase in reading comprehension scores and an eagerness to participate in the reading activities.

The ultimate conclusion of Hollingsworth's study, that the personal contact between pupil and the teacher is not of crucial importance to the NIM, was supported in a later study by Mikkelsen (1981). Mikkelsen employed a more accessible device than Hollingsworth's monitoring equipment to substitute
for the intense teacher involvement, in this case a tape recorder. The results of the study indicated that a group of students who read in unison with tape recorded material actually performed significantly better than a group participating in the more traditional form of the NIM.

The NIM also can be used in conjunction with other remedial methods and several studies purport the combinations to be quite successful. Bos (1982) combined the NIM with "the method of repeated readings" as outlined by Samuels (1979) and included a modified cloze procedure to effectively increase comprehension in students with severe reading disabilities. The method of repeated readings requires students to reread short meaningful passages until a satisfactory level of fluency is achieved. It can be done either with or without audio support. When used with the impress method, Kann (1983) found that the two techniques not only promoted the development of oral fluency, but also increased syntactical competency in readers deficient in those areas.

The Directed Reading Activity (DRA) also has been effectively paired with the NIM. Henk (1983) found in his work with the impress method that students often wanted to discuss their assigned reading material more at length than NIM procedures permitted. Henk merely substituted the NIM's unison oral reading for the guided silent reading step of the DRA. While the post reading discussions and extensions
of the DRA are more involved and teacher-directed than those allowed by the NIM, it is in the prereading step of the DRA that the greatest differences lie between the approaches. Where the NIM purposefully neglects preparing the students for what they are about to read, the DRA encourages students to retell the story events from the previous session and then to speculate about what happens in the passage about to be read. Henk concluded the primary advantage of this NIM modification was that it allowed students to deal with reading material that normally would be beyond their decoding abilities. While the impress approach is presented as a particular method with specific procedures to be followed, it is evident from these examples that it can be adapted in a number of ways without diminishing its effectiveness, and possible improving its usefulness.

Future research on the NIM should examine the effectiveness of the approach when certain variables are manipulated as was the case in the previous examples. A worthwhile endeavor should involve exploring the use of various consequences or tangible enforcements in conjunction with the approach. Yet, probably the most valuable research should be concerned with verifying the population for which the NIM is most effective. A clarification of the characteristics of the remedial reader most likely to benefit from the impress method should be extremely beneficial to the classroom teacher. There exist numerous interesting testimonials to the NIM's efficiency,
but, unfortunately they do not always assist the teacher or reading specialist in wise decision making for their remedial readers. To reiterate, no one technique is successful with all students, yet much exploration is needed to determine which reading deficits are more responsive to specific remedial methods and to establish a profile of the individual who should profit most from a given method.

At this point this may be a formidable task, for the expanse of current reading research is vast and its direction varied. While some researchers (Lewis, 1983) emphasize perceptual modality weaknesses in reading remediation, others have concluded that the key to correcting reading disorders will be found in focusing on students' reading skill strengths (Gentile, Lamb, & Rivers, 1985). Future researchers will need to choose their variables carefully and attempt to be as rigorous as possible in conducting experiments.

Despite the NIM's accepted utility as a remedial approach, it is not a panacea for the problems of all disabled readers. The method should be used selectively with students whose profiles future research should clarify. Ideally, the method will result in greater numbers of remedial students who not only have learned to read but also can read to learn. Perhaps if more students were taught reading in a total immersion program, free from pressure, then more might learn the process and begin to enjoy the act.
REFERENCES


