CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

MULTI-MODALITY METHODOLOGY VS. PHONICS IN THE LEARNING OF ESSENTIAL VOCABULARY WORD LIST

A thesis submitted partial satisfaction of the requirements for the degree of Master of Arts in Special Education, Learning and Reading Disorders by Kathleen Shults-Ball

January, 1980
The Thesis of Kathleen Shults-Ball is approved:

Grace E. Lee

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To my son...

Stevie whose problems led to my interest in the field of Special Education and to my loving husband and daughter for the help and encouragement they have given me in this endeavor.

Kathleen Shults-Ball
ABSTRACT

Multi-Modality Methodology vs. Phonics in the Learning of Essential Vocabulary Word List by Kathleen Shults-Ball Master of Arts Special Education

Based upon literacy statistics presented by the American Bar Association (1975) supported by grant (73-ED-99-0012) from the National Institute of Corrects, and the Law Enforcement Assistance Administration, U.S. Department of Justice, research was undertaken to determine treatment efficacy of traditional methodology vs. special education methods which used a Language Master whole word approach.

Treatment of juvenile delinquents as a special education population has been advocated by Mesinger (1976). The population selected for comparison exhibited many of the characteristics noted by Strauss (1947). Special education methods have been employed based upon the findings of Kennedy (1954) and also due to an increased
number of commitments for substance abuse.

From a population of 448, fifteen pairs were found to be comparable in pretest scores on Gates-MacGinitie, WRAT, Essential Vocabulary List, Otis-Lennon, age, sex, ethnic background and socio-economic status. Subjects were assigned either to Phonics or to Multi-modality treatment. Both groups received reading instruction from the same reading teacher. Subjects in both groups were given candy treats when they won Bingo's in skill reinforcement games.

Results indicated that the Multi-modality group showed statistically significant gains at the .01 on Essential Vocabulary posttest and gains significant at .05 level on Gates-MacGinitie postest. The Phonics group showed a slight, but not statistically significant gain over the Multi-modality group on WRAT postest.
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Chapter 1

INTRODUCTION

The delinquent behavior of adolescents often has begun with school truancy. "Behavior problems in the classroom in many cases appear before more serious delinquency." (Fox, 1976, p. 11) Schools have often suspended students for truancy. Students have been suspended for deviant behavior in the classroom. Removal of the problem adolescent from school may tend to create more problems than it has solved. These teenagers have been removed from the setting which was designed to teach them the basic skills needed to obtain employment.

According to Mesinger (1976), "Although the social problems presented by delinquent youth have long troubled societies, rehabilitation efforts have (with a few notable temporary exceptions) been relatively unsuccessful. The juvenile court correctional system has repeatedly tried to treat delinquents as 'sick individuals' using a medical model." (p. 22)

Mesinger has also stated that the delinquent population is basically normal and that the failure of treatment programs based upon a medical model should not have been surprising.

When one looks at literacy statistics and finds "that about one-half of the individuals in our correctional
institutions are functionally illiterate..." (Bacon, 1975), p. 11), perhaps an educational rehabilitation model would have been more beneficial. Mesinger (1976) saw this model as having an important role in it for the Special Education Teacher. "The severe academic retardation and the many indices of other widespread disabilities or handicaps suggest that this is a population which places great demands upon the skills and educational talents of all who work with them." (p. 26) The author concurs with his findings, and it was the contention of this study, that many of these adolescents presented motivational problems, behavior management problems, and were in need of specific and general academic remediation.

Generally remediation programs require diagnostic testing. Typically Colston Youth Center delinquents entering the program were given a battery of tests after they had been committed by the court to this rehabilitation facility. Results of these data were then used to plan individualized programs to remediate students academic needs. Data collected over a three year period indicated that although only 5% of the population scored below 70% when administered the Otis-Lennon, given on an individual basis and read to students who were not able to read, 64% of the population were found to read on or below the sixth grade level. Even larger numbers (see table 6) were found to be functionally illiterate based
upon the definition of literacy given by Carsetti (1975) who has stated, "a literate person is defined as having the ability to read at a sixth grade level. However, major portions of what is written for public consumption are geared to a higher reading level. For example, most food stamp applications are written at eighth grade level, warranties, rental agreements, directions of food packages and the like, as high as the twelfth grade level. Those who cannot cope with this functional written material, yet have some reading knowledge are said to be functionally illiterate. Anyone with just a basic (first or second grade level) knowledge of reading is said to be illiterate." (p. 1)

At the Colston Youth Center 30% of the students have been identified as learning disability students by the school districts from which they have come. Those students, who upon entering the program, scored on or below grade six, or were not able to score on the vocabulary and/or comprehension sections of the Gates-MacGinitie Reading test were assigned to a Remedial Reading Program.

The Problem

The question that first had to be answered was one concerning curriculum. How can the needs of students to be able to interpret and respond to written symbols best
be met during the 90 days that they will spend in the Colston program? The Reading Teacher, (1963) offered a possible answer when it gave the Essential Vocabulary List, and Essential Driving List.

The effectiveness of methodology must always be open to critique and review. Phonics is an accepted method of remediation, approved of by the grand jury and the board of education. To deviate from accepted methodology one must be prepared to defend their program with results in terms of their stated objectives, and be able to verify these results with standardized tests.

The wisdom of teaching phonics, with the hope that students would be able to generalize from a set of decoding rules, and apply these rules to interpretation of printed symbols was first called into question by a student, who stated one Friday, while playing a sound game that had been composed by this author for the purpose of reinforcing decoding skills, that they should instead be playing word games with the list of important words they had been trying to learn.

Rationale

Learning a list of words commonly used in our society makes more sense to the learner. Students were more motivated to attend to and learn that which made sense to them. This idea is supported by Frank Smith (1977),
who has stated, "Children will not learn by trying to relate letters to sounds, partly because the task does not make sense to them and partly because written language does not work that way." (p. 387) According to Smith, "reading is not a matter of decoding letters to sound but of bringing meaning to print." (p. 387)

The student mentioned in this study was not questioning either importance or meaningfulness of the words he had been required to learn. What he was questioning was the methodology that had been employed to accomplish this objective.

Students coming into the Colston program received a battery of tests. They were given the Wide Range Achievement Test (WRAT), the Gates-MacGinities Reading Test, the Otis-Lennon Test of Mental Ability, form J, and a pretest on the Essential Vocabulary List. Students who received reading scores on or below grade 6 in accuracy, vocabulary and/or comprehension sections of the Gates-MacGinities were placed in a remedial reading program.

The 90 day time limit of the Colston program, statements made by a student and by Frank Smith (1977), caused this researcher to turn to the use of a Bell and Howell Language Master and headphone set as an alternative means of instruction. The Formula Phonics pals game was replaced with words from the Essential Vocabulary List, and used the same Bingo format.
**Purpose**

The purpose of this study was to examine the effects of Formula Phonics combined with reinforcement games, with an approach that used Multi-modal input and reinforcement games.

**Research Hypotheses**

When variables such as teacher, IQ of students, reading test scores, pretest score on the Essential Vocabulary List, ethnic background, age, sex, and socio-economic background were controlled, students taught by the Multi-modality method would make significantly greater gains (at the .01 level of confidence), in learning the Essential Vocabulary than those taught using the Formula Phonics Method.
SUMMARY

It has been stated that school related behavior problems often have precipitated more serious delinquency problems. Literacy statistics, published by the American Bar Association (1975) have indicated that one-half of these delinquents were functionally illiterate. It was the contention of this study that the education of this delinquent population, due to the learning and behavioral characteristics they exhibited, constituted a special education population, and that special educational methodology would best serve the needs of such a population. It was the purpose of this study to compare two methods of instruction which have been purported to be effective methods for rehabilitation of the disadvantaged reader.
Chapter 2

REVIEW OF LITERATURE

Special education has focused most of its attention on the younger child. This has left the adolescent, who often spent most of his earlier years of education, in the protective womb of the special education class, thrown into a new setting without the supports he had previously been able to depend upon.

"Characteristically, the provision of educational services for behaviorally disordered adolescents has lagged far behind services for younger pupils, particularly in the public schools." (Kauffman & Nelson, 1976, p. 29) Kauffman and Nelson have stated that factors such as "the structure of secondary education, departmentalized subjects, classroom switching, heightened emphasis upon academic achievement, and so on may limit program options." (p. 29)

The increased emphasis on social skills makes the transition to Junior high school difficult, because the child suffering minimal brain-injury has impairment not only in academic areas, but also in his ability to relate socially as was noted by Siegel, (1975). A lack of temporal awareness has often made going from class to class and arriving on time for each class very difficult. The child having collected a stack of tardy slips may then be suspended from school.
A problem with time was often found among delinquents. A review of their school records indicated that about 70% of the Colston population had been suspended from school for tardiness, truancy, and frequency of having been involved in fights with other students.

The similarities between hysterics, brain-damaged individuals and psychopaths was pointed out be Kennedy (1954). Kennedy in postulating constitutional similarities among these groups also pointed out that diseases such as encephalitis which damaged certain regions of the brain often resulted in the occurrence of many psychopathic symptoms. Halleck, (1967) made a similar report. Most of the educational literature has ignored the effects upon the brain produced by paint sniffing, PCP and various other drugs and chemicals. At least 85% of the population found in detention and rehabilitation facilities in Ventura County have had a history of substance abuse. Such a history has increased the probability of brain damage. Methodology found to be appropriate for other categories of learning disabled students therefore seemed appropriate academic treatment for this delinquent population.

REVIEW OF THE LITERATURE

The sensory impairment found in the delinquent population makes programs aimed at remediating sensory
problems attractive to the author of this study. We are all sensory learners. "The senses are the contact between the intellect and the real world." (Montessori, 1964, p. 22) Montessori has also postulated that the way in which we perceived the world around us, related to it, and learned from it, depended upon the quantity and quality of our percepts. We have all therefore, provided of course, that these sensory mechanisms are in tact, been multi-modality learners.

Multi-modality approaches have been used for a number of years in the field of special education. They have been popular for several reasons: 1. By involving all of the senses in the learning process they may have reduced hyperactivity by eliminating some of the sources of distractability and involved those senses that might otherwise have been receptors of distracting stimuli, in the learning process. 2. The use of more than one modality at the input stage may have strengthened the memory trace and helped "carry the memory until growth change is made." (Hebb, 1949, p. 62) Furthermore this form of input may have helped to facilitate the growth of the cell assembly. "When an axon of cell A is near enough to excite a cell B and repeatedly or persistently takes place in one or both cells such that A's efficiency, as one of the cells firing B is increased." (p. 62) This dual trace described by Hebb offers the organism the
obvious advantage of providing it with an extra set of keys to unlock the memory and retrieve it at will.

Gibson and Walk (1958), have attempted to prove perception was innate. They conducted a series of experiments involving the visual cliff. Their study used 36 infants, 33 of the infants used in the study seemed to have the innate capacity to discriminate height. Three of the infants were, however unable to do so.

The theoretical arguments of innate vs. learning in the field of perception have not been useful to educators. The fact that three of the infants failed to make this discrimination has raised the following questions:
1. Can that which appeared to be innate for most members of our species be taught to those for whom it was is not innate? 2. Was visual depth perception really innate for those 33 infants in the study, or were they just developmentally more advanced than those three who failed to make this discrimination?

Hebb (1949) with his neurophysiological model was very appealing to educators. When he suggested the possibility of strengthened traces resulting in permanent structural changes in the neural pathways, many educators developed a renewed interest in the teaching methods that had been developed by Maria Montessori. Educators have found her materials useful because: 1. they isolated the stimulus, helping the child to concentrate, 2. they
combined the use of the senses by providing tactile kinesthetic, and visual stimulation, and 3. the structured nature of the materials helped the child to organize himself.

Strauss, an early pioneer in the field of multimodality learning, found that some children who failed to achieve social and academic success exhibited characteristics similar to those found in brain damaged adults. Some of these similarities included; visual and auditory figure ground problems, perseveration, thought disturbances, erratic, uncoordinated, uncontrolled, uninhibited movements and socially unacceptable disinhibited behavior.

According to Strauss and Lentinen (1947), the educational and emotional problems of brain injured children can be traced to their "organic restlessness and distractibility." (p. 130) The treatment program they designed included manipulating and controlling the overstimulating external environment, and in educating the child to develop voluntary control.

Color was used in the Strauss program to emphasize figure ground. Materials were simplified to remove distracting stimulus. The basic principle behind all material used in this program was to provide a structure that would aid the child in overcoming his perceptual problems by providing the necessary crutches until skill and understanding were secure. The use of visuals that
were simple and nondistracting has been supported by the extensive research done in this area by Dwyer (1967, 1976). During 12 years of investigation, he obtained data from 2,500 high school students and 10,000 college students, concerning the effect of specific types of visual aids. His studies questioned the realism theories which contended that the greater the degree of similarity between a situation and a visual, the easier it would be for the student to learn from it. His studies tested the hypothesis that instruction could be made more effective by editing reality. It was found that the abstract linear presentations were more effective. One of the reasons offered for these presentations being more effective was that they eliminated unnecessary distracting detail and heightened figure-ground distinctions. This study would seem to justify the need to clarify the figure-ground relationship that Strauss advocated in his program.

Structure and Learning

The program designed by Cruickshank showed the Strauss influence more closely than did the programs of some of Strauss' other famous students. Cruickshank placed a very strong emphasis upon structure. He identified structure as having four major components: 1. Relationship structure (the student-teacher relationship) 2. Environmental structure (the class room) 3. Program structure
The environmental structure that he recommended were all to be one color. The classroom was not to have a bulletin board and there should be no windows. Some of these things were also advocated by Strauss. Cruickshank also advocated sound proof cubicles. He stated that materials were to be geared to the child's attention span. He advocated an individualized program aimed at teaching to the child's distractibility. Where figure-ground perceptual difficulties were present, he theorized that the stimulus value of the perceptual components would be increased by using heavy outlining with contrasting colors.

A few studies have attempted evaluation of the efficacy of these programs. Barnett, Ellis, and Pryor (1960) matched brain-damaged and non-brain-damaged children on a variety of variables, comparing their learning on six different types of skills in which differences in favor of the neurologically unimpaired groups would have supported the Straussian theory. The brain-damaged children performed less well on only two of these learning tasks. The authors concluded that the proposition that brain-damaged children learn differently from the non-neurologically impaired must be questioned. Cruse (1961) found no differences in distractibility between brain-injured children and ordinary familial mental retardates of equal
mental levels. Rost (1967), found that the use of isolation booths during one semester had no measurable effect on the classroom learning of brain-injured children. Levine, Spivak, and Fernald (1962), found differences in visual discrimination learning between groups of brain-injured, emotionally disturbed, and normal children, favoring the normal and emotionally disturbed. Maring and Phillips (1962), found that groups of emotionally disturbed, but presumably not neurologically damaged children profited significantly by a program which was structured along the lines recommended by Cruickshank. This study provided support for the proposition that the highly structured programs designed for the brain-damaged were useful for children with behavioral characteristics similar to those who have been positively identified as brain-injured.

McCormick, Schnobrick, and Footlik (1966) provided some support for the Straussian hypothesis. They compared and equated two groups of first graders, one of which received perceptual motor exercises systematically for nine weeks with a group which received an equivalent amount of physical education activity. Subsequent testing revealed no significant differences between the means of the reading achievement scores of the two groups. However, a subgroup of underachievers in the perceptual motor trained groups did show significantly greater improvement.
in reading then did those whose reading achievements were more in keeping with their aptitudes.

Myklebust (1973) reported extensive studies done to test language differences between various groups of exceptional children. He found that "the socially-emotionally disturbed were inferior to those with disorders of articulation..." (p. 154) The results of these studies have obviously been equivocal. Perhaps the nature of the tests and the location of the lesions and the type of disorders investigated in these studies account in larger measure for these results than the characteristics of the populations studied. These results suggest the need for further testing and yet, recent studies in these areas were not available.

Kephart's association with Strauss influenced his work. According to Kephart vision and audition as well as the motor system are the avenues that we depended most upon for academic learning. He stated that, "...one problem is the organization and integration of perceptual and conceptual information." (p. 4)

According to Kephart, "One of the primary effects of brain injury is the disruption of the organization of behavior both on the input side where information is entering the organism and on the output side where responses to the stimuli are being patterned." (p. 11) His descriptions of the symptoms and characteristics of
these children are about the same as those given by Strauss and Cruickshank. According to Kephart, learning occurs from the organism's encounters with the environment; "...as a result of these encounters, information about the environment is systematically retained in the organism for use in later encounters. The responses of the organism are modified or expanded so that the satisfaction obtained from the encounter is maximized." (Kephart, 1967, p. 19)

Kephart's theory is developmental. He has listed the following stages of development: 1. the motor stage, 2. motor-perceptual, 3. perceptual-motor, 4. perceptual, 5. perceptual-conceptual, 6. conceptual-perceptual. Difficulty at the perceptual-motor stage caused weak inconsistent figure-ground relationships. "The relationships between elements in a form will not be apparent to him. As a result he will deal with details of the form rather than the form as a whole." (Kephart, 1967, p. 33)

To remediate the problem it is necessary to determine the point in the developmental sequence where his achievement has broken down." (p. 33)

According to (Strauss and Kephart, 1955, p. 90-91) "...development in perception is undirectional and irreversible. It goes only toward wider richer perceptions, never toward less diversification." After having developed beyond a certain stage a person can not change their perceptions back to an earlier stage.
Kephart (1967) has stated, "a primary symptom of learning disorders is an interference with the process of integration." (p. 43) To promote integration he recommended that more than one modality be used for input. He stated that the three sense avenues most important were visual, auditory, and tactual. (p. 66) He stressed the importance of redundancy in development of integration. The importance of redundancy has also been supported by Frank Smith (1971). Tactile approaches to language have also been advocated by: Cooper, (1947); Fernald, (1943); Gillingham and Stillman, (1956).

Recent studies supported Kephart's theory on the importance of using more than one sensory avenue as the means of input. Hoffman (1975) has stated, "Not only must the child's auditory modality be intact and integrated (intra-auditory integration) it must also be integrated with a visual representation." (p. 266) She concluded that integration was not produced when you remediated one sensory modality in isolation. These findings supported those found by Bursuk (1971) who conducted a study to test the comparative effectiveness of correlated listening-reading and reading-only comprehension lessons using high school retarded readers with varying sensory modality preferences. For one semester comparable lessons were taught to two groups matched for IQ, age, reading grade level, and freedom from organic auditory or hearing impair-
ment. The difference between the instructional treatments was one of modality—-one group was taught using both aural and visual methods and the other, using a visual approach only. Results from a standardized reading test showed that when sensory learning modality preference was not a variable, a correlated listening-reading instructional approach was more effective than a reading-only approach. Specifically, the listening-reading approach was found to be extremely effective for auditory learners and for students with no sensory modality preference. One conclusion was that in a group of students undifferentiated by learning modality preference, an aural-visual teaching approach to reading was more effective than a strictly visual approach.

In an extensive Title III Project (Jones and Landis, 1972) found that learning activities should be designed to include as wide a variety of sensory activities as possible. They have stated, "A variety of instructional modes should be made available to the student. It may be determined that student A is primarily an auditory learner; i.e., his learning is facilitated through auditory channels. If this should be the case, then mediated instruction should be auditory in nature. The focus of any seminars should be auditory learning, and so on. Students should not, in all probability, be restricted to only one instructional modality. They should have the opportunity to
learn in a variety of instructional modes. The important consideration to keep in mind is that the instructional modality should be matched to the student's learning modality. "Students must have the option of obtaining the same information through as many different senses as possible." (p. 20)

The program developed by Barsch was similar to that of Kephart in that it showed the influence of Strauss and Piaget in its emphasis on the importance of sequential development in early sensory-motor learnings before more complex perceptual and cognitive development could occur. They have both been concerned with the development of eye-hand coordination, temporal-spatial relationship and form perception. Kephart and Barsch both have developed Multi-modality programs but have differed in how programs were structured. Kephart sought to promote sensory integration by simultaneously using more than one channel of input. Barsch on the other hand used each modality separately around the same theme to make the child more sensorially aware of each of the channels that he or she possessed. Both methods have used redundancy and may have strengthened the memory trace.

Barsch has viewed the child as being a constant mover. According to his concept movement enabled the child to be oriented in space so that his activities and experiences become more complex patterns. The classroom structure
advocated by Barsch differs radically from that of Cruickshank, Kephart, or that of the normal classroom. Instead of building cubicles that reduced movement and eliminated sensory input, he has recommended the removal of the classroom furniture so that more space was provided for movement. Lines were drawn on the floor that guided the child on entering and leaving the classroom. Work at the chalkboard, and other activities for enrichment of the theme for the day were a regular part of the Barsch program. His students were taught auditory processing by being asked to follow a set of verbal commands.

Although research literature abounds with studies that have been done to prove or disprove the efficacy of perceptual motor training, such as those done by: Smith, (1969), (1970); Hammill, (1974); Smith, (1969), (1971) and others, to date no comparative studies have been done to evaluate the Barsch and Kephart approaches as to which method has been the most effective in promoting sensory integration.

Tests and studies done along this line should also attempt to determine differences which may exist in program efficacy between familial retardates and learning disability students to determine which group derived greater benefit from programs that dealt with one channel of input at a time, and which group benefited most from instruction that used more than one channel simultaneously.
The area of the brain that has been damaged may also have had an effect upon stimulus reception and therefore could have created differences in the way an organism responded to treatment. Perhaps some students suffering from faulty integration experienced stimulus confusion when presented with two different forms of input simultaneously. In a study done by Rosenberg and Herb (1977), it was discovered that when subjects were presented with information via simultaneous input that subjects reported having only one single memory of the event. Do most normal subjects such as those tested in this study block out one of the forms of input they have received, or attend only to the input coming to them through their preferred modality? These are some aspects of learning that need further examination.

If one of the purposes of multi-modality learning has been to provide a dual trace, and simultaneous input has resulted in a single memory it might also follow that only one trace has been formed. If this were true then programs that presented the information through different channels non-simultaneously would be more effective in producing a dual trace.

**Visual Training**

Frostig (1961) defined perception as, "the ability to recognize stimuli." This ability included reception of sensory impressions and ability to interpret and identify them as they were related to previous experiences.
The major senses for communication with the environment are vision and hearing. The former modality, vision, appears to have been more important than the latter for perception of the environment. Tasks performed by the child are mostly visual. Success in dealing with visuals tasks depended a great deal upon the child's visual perceptual proficiency. Learning to read was one such task.

Marianne Frostig (1961) published her test of visual perception and developed a specific remedial program for the perceptually handicapped. Her remedial program was directed at the development of five areas of visual perception. The five visual perceptual ability areas that the tests and worksheets focused on were: 1. perception of position in space, 2. perception of spatial relationships, 3. perceptual constancy, 4. visual-motor coordination, and 5. figure-ground perception. Since the tests tested the same areas of perception as those covered by the Frostig worksheets, most children given the Frostig remedial program showed improvement when given the Frostig postests.

A number of investigations have been done to evaluate the visual training programs of Frostig and Getman. Advocates of these programs rely theoretically upon Hebb, Piaget, Itard, Sequin, and Montessori. Within the optometric profession there has been some disagreement as to the appropriateness of specific techniques, especially
those included in the broader based sensory motor programs proposed by the developmental vision training groups. Rosen (1966) and Flax (1970) have described some of the confusions of conceptual framework and practice which abound when relating visual function to reading problems. Rosen investigated the effects of the Frostig remedial program worksheets. He compared groups of first grade children.

The Subjects used for this study were tested on the Metropolitan Readiness Test and the Developmental Test of Visual Perception (DTVP) at the beginning of the school year, and retested on the DTVP later on in the year. The experimental group received 29 days training on the Frostig material (30 min. per day). The control group received 15 min. extra reading time, while the experimental group had 15 min. more reading time than the control group. Results showed that additional reading time was more important than perceptual training, that improvement in perceptual skills was not reflected in later reading ability, and that students given perceptual training showed increased perceptual ability as measured by the DTVP. It appeared likely that individual gains in perceptual ability may have been obscured by other factors. Reading itself may be one form of perceptual training. Flax (1973) in response to the ad hoc committee sponsored by The American Academy of Pediatrics, The American Academy
of Ophthalmology and Otoparygony, and The American Association of Ophthalmology takes issue with the following statement, "...vision training and glasses are ineffective and furthermore, such training has frequently resulted in unwarranted expense and has delayed proper instruction for the child." (p. 60) According to Flax, the studies cited in the report were taken out of context. Flax has supported visual training programs. Benton (1973), cited one of his own studies in response to the article by Flax. He reported that his dominance treatment in 1500 children resulted in improvement in 75 percent, his other treatment group that ignored dominance factors netted the same 75 percent improvement. Benton concluded that the committee's findings were correct.

Black (1974), conducted a study of high and low perceiving learning disabled children in which subjects were matched in age, school grade, socioeconomic status, IQ and sex. He found that when the achievement of the high and low perceiving groups was compared, it was found that reading test performance of low perceivers was significantly higher than that of the high perceivers. He concluded that visual-perceptual evaluation and remediation did not appear to be an efficient way to promote academic success.

The results of these studies and others have indicated that perception can be taught, but results also have
indicated that perceptual training should not be taught as part of the reading program.

A review of the research indicated that the visual modality was by far the most important modality in the reading process. Rohwer (1972), in his research has supported the developmental theorists. He stated that use of concrete visuals helped to promote word recognition. Showing the child two concrete objects according to Rohwer (1972) and performing some action in which these two concrete objects were shown to interact with one another helped to stimulate the elaboration process. Feeley (1975) made a distinction between visual literacy and verbal literacy. In her article she contended that we often have ignored the natural literacy that the child has brought to school from his visual environment. She described the method used by Dorothy Lopez, a special education teacher in New York City. The students were taken on field trips where they took pictures. Stories were then told to the teacher or to the aid who recorded them in print for each child's own photo story book. As a result of her study she has stated, "School does not have to be a print dominated experience but can combine both the visual and the verbal to be a natural extension of our visual culture." (p. 10)
SUMMARY

The major advocates of multi-modality learning have based their programs on a developmental model and are indebted theoretically to Hebb (1947). The research has indicated that perception can be taught, but should not be taught at the expense of regular time allowed for the reading program. The effectiveness of the reading program can be enhanced by the use of visuals that the child can relate to. Multi-modality learning experiences seem to be an effective remedial method. The decision of which type of presentation to make should be based upon individual student needs. The teacher should closely monitor the child's progress when using simultaneous or multiple experiences by testing long term recall. Studies in the future to determine the efficacy of these two methods of Multi-modality instruction would be more useful to reading teachers than studies to determine the efficacy of perceptual-motor or visual-motor training.
Chapter 3

METHOD

The delinquents at the Colston Youth Center often have had a history of school truancy. Colston's program has been set up based upon the belief that rehabilitation can best be served using an educational model. Regular school attendance was mandatory for participation in the Colston program. Students who refused to participate and cooperate with the school program were removed from this Rehabilitation Facility. After students had been at Colston for 45 days they were able to go home on leave. The number of leave hours they earned depended upon their house ratings and their school ratings. Although they received house ratings seven days a week and school ratings were based on the number of days they attended school, their school ratings were given equal weight with house ratings in determining the number of hours leave time each resident received. Leave time policy was a typical example of the importance this facility placed upon role of academic treatment in rehabilitation of youthful offenders.

Subjects. The subjects were 30 male delinquents, ages 13-16 who had been placed at the Frank Colston Youth Center by the juvenile court. Students were selected for participation in a special, intensified remedial reading program with no more than 12 students per class, based
upon their scores on the Gates-MacGinitie Reading Test. Students selected for the special program were given two 45 minute periods per day of reading instruction with a reading specialist. Subjects for the first year and a half that this program was conducted received one period of instruction using the Formula Phonics method. Subjects in the Colston Remedial Reading Program the second part of this three year study received Multi-modality instruction. Other components of the reading program were held constant.

Data were gathered on all of the students in the special reading program and a sample was selected and paired for analysis. The Gates-MacGinitie and WRAT (reading) tests scores, Essential Vocabulary pretest scores IQ on the Otis-Lennon, form J, age, sex, ethnic background, and socio-economic status, as determined by the courts findings of the family's ability to pay for the juvenile's incarceration, were comparable. The same teacher was used as the reading instructor for both groups.

Aparatus. A Bell and Howell Language Master 7/58 and headphone set, game cards with Essential Vocabulary words on one set and formula phonics pals on the other set, candy, flash cards, paper, pencils, and copies of the following tests; Otis-Lennon, form J, intermediate level, Gates-MacGinitie, forms E and E2, WRAT Reading Test, Essential Vocabulary List, Essential Vocabulary Cards,
Formula Phonics decoding information cards and pals cards.

Procedure. The Otis-Lennon was administered to all subjects entering the program. This test was read to each subject and administered on an individual basis. (See Appendix Tables 1 & 1 for more information on IQ scores). The Gates-MacGinitie was also administered on an individual basis. To avoid fatigue, students were not given both tests the same day. Subjects who scored below grade 6 on any of the Gates subtests were referred to the reading specialist for further testing. The reading specialist gave them the WRAT to determine decoding ability, and the Hoffman Comprehension Assessment Test to evaluate comprehension skills. Essential Vocabulary Words were presented on flash cards. Subjects were asked, "Can you tell me what this card says?" If the student said no, a check mark was placed on the teachers copy of the Essential Vocabulary List next to the word he had missed. This testing procedure has been used on all students who have entered the Colston program from 1976-1978, provided of course that they did not become absent without leave, or were not removed for failure to adjust to the program.

From a population of 448 delinquents admitted into the Colston program, 286 were found to be eligible for the special reading treatment program. From this group twenty pairs were found to be comparable at the time they were screened for the reading program. Five of these
pairs had to be eliminated from this study. One subject was removed for assaulting another student, two subjects were removed from the comparable sample for paint sniffing, another for having been absent without leave, and another was booked at juvenile hall for a crime he committed while he was on his weekend leave from Colston Youth Facility. The final number of comparable pairs were 15.

The Formula Phonics group was given phonics instruction according to the method designed by Vail (1971). Subjects were taught that; 1. B, D, J, K, P and T are the exploding letters. To say these letters you make a dam of air in your mouth. 2. F, S, W and Z are the friction letters, they make the same sound or no sound. 3. H, L and R are called the open letters, because you do not move your jaw when you say these letters. 4. M and N are the nose letters, because you cannot say these letters if you hold your nose. 5. Qu and X are the crazy letters, a) Qu is considered as one letter because they always appear together, and make just one sound. b) Qu takes on its Latin Kw sound 98% of the time. c) Qu has its French K sound in only a few words, such as liquor and conquer. 6. C and G are known as the thieves. A) C steals the S sound in some words, and the K sound in others. It has no sound of its own. b) G has a sound of its own, but occasionally steals the J sound. 7. W and
Y are the **two faced letters**, because they sometimes function as friendly consonants, and other times as enemy vowels. 8. The vowels are called the *enemy letters* because they have many sounds. A vowel can; A. say its short sound, B. say its name, C. say nothing, or D. say something else. With the vowels the student is taught to; 1) try the short sound first, 2) a vowel says what it must to make sense and when two vowels go walking the first does the talking. The vowel digraphs and consonant digraphs are called *pals* and are taught by the students learning them in groups that are associated with different geometric shapes. Students need only to learn the rules and remember the following formula:

A. Take off the suffix C  
B. Underline the pals  
C. Mark the letters which steal sounds (thieves and two faced letters) /  
D. Mark out the silent letter /  
E. Mark the remaining vowels ___ or  
F. Sound out the word  
G. Decide if the word makes sense in the sentence

The phonics group in addition to this basic set of instructions received worksheets and played pals bingo. The winners received a candy reward. Part of the phonics
dialogue was the Essential Vocabulary List.

Students in the Multi-modality group were given a set of Language Master cards containing the words they had missed on the Essential Vocabulary pretest. They were assigned time on the Language Master proportional to the number of words they had missed on the Essential Vocabulary pretest. The skill reinforcement game played by this group consisted of the words on the Essential Vocabulary List. The winners were given a candy reward.

Students at the end of their 90 day commitment were posttested on the WRAT, Gates-MacGinitie, form E2, and the Essential Vocabulary.
SUMMARY

A study was conducted for a three year period at the Colston Youth Center. Subjects were given a battery of diagnostic tests upon entrance into the Colston School Program. Students found to be disadvantaged readers were referred to the reading specialist. 64% of the subjects tested were found to have been reading at or below grade 6. From this group of subjects who received scores on the Gates-MacGinitie below grade six, a comparable sample of 15 pairs were selected for the purpose of evaluating the effectiveness of two methods of treatment. One group was given Formula Phonics Treatment and were expected to apply this method to decoding the Essential Vocabulary List. The other group received Essential Vocabulary instruction using a Bell and Howell Language Master. The Phonics group received reinforcement of the Pals by playing a Pals bingo type game. An Essential Vocabulary word game using the bingo format was played with the Language Master Group. Both groups received candy treats when they had made a "bingo". The same reading teacher was used for both groups.

At the end of their 90 day commitment subjects in both treatment groups were postested on the WRAT, Gates-MacGinitie and Essential Vocabulary.
Chapter 4

FINDINGS

The disadvantaged readers at the Colston Youth Center did not have free access to grocery stores or school candy machines. This limit on availability of candy treats afforded the reading teacher the positive advantage of being the dispenser of goodies. A reading teacher who gave out candy treats may have been perceived as less threatening by her students. The subjects used in this study were comparable in IQ, pretest reading ability, as measured by the Gates-MacGinitie, WRAT, Essential Vocabulary, age, sex, ethnic background and socio-economic status. Students seemed willing to try to improve their reading by both methods used in this study.

Results

The Phonics group and the Language Master group of comparable pairs were tested at the end of their 90 day commitment on the WRAT Reading Test. Data were evaluated using the test of the hypothesis of the difference of two dependent means and \( t \) for dependent groups was computed, \( t (14) = 1.69 < p .05 \). This value for \( t \) indicated that the Phonics group when paired with comparable subjects who were given the Language Master treatment showed a slightly greater, although, not a statistically
significant increase over the Multi-modality group when posttested on the reading section of the WRAT.

Evaluation of the Multi-modality group when compared to a comparable sample of subjects who had received Formula Phonics instruction when posttest data were evaluated using the test of the hypothesis of the difference of two dependent means was computed. \( t \) for dependent groups yielded \( t (14) = 2.24 > p.05 \). This value for \( t \) indicated that the Multi-modality treatment group showed statistically significant gains when compared with a similar group of subjects who had received the same averaged pretest scores of the Gates-MacGinitie. (It should be noted that the averaged Gates-MacGinitie pretest and posttest scores did not have the speed test included in the averaged scores). The group receiving the Language Master treatment scored significantly higher on the Gates-MacGinitie than a comparable group of subjects who received the Formula Phonics treatment.

Posttest data on the Essential Vocabulary were evaluated using the test of the hypothesis of the difference between dependent means; \( t (14) = 5.99 > p.01 \). The subjects who received the Multi-modality treatment scored significantly higher on the Essential Vocabulary posttest than comparable subjects given Formula Phonics treatment.
SUMMARY

Comparable pairs of subjects were postested on standardized reading tests to evaluate the effectiveness of Formula Phonics vs. Multi-modality treatment for disadvantaged readers. The Phonics group scored slightly higher on the WRAT Reading Test. The Multi-modality group showed increased scores, significant at the .05 confidence level on the Gates-MacGinitie. As had been predicted the group receiving the experimental Language Master treatment showed a gain significant at the .01 level when postested on the Essential Vocabulary.
Chapter 5
DISCUSSION

Adolescent behavior problems often begin with school problems. School problems often start when the child is unsuccessful in learning how to read. The retarded reader finds himself disadvantaged in every academic class. His inability to read and follow written directions usually causes him to be a poor student in Math, Science and Social Studies, as well as, his more obvious failure in Reading and/or English.

The problems faced by the disadvantaged reader become more acute at the secondary level, due to decreased formal emphasis on reading instruction and increased demands in the quantity and complexity of materials. The stress this increased demand has placed upon his limited reading skills can lead to frustration and anxiety. His academic problems may further be complicated by his having to adjust to a new school environment, in which he no longer has the security of the same teacher all day. He must now cope with having to find his way to five or six different classes located in different places on a strange new campus, and learn to deal with five or six new teachers. The number of people who will know that he has a problem has just been multiplied by five or six.

Failure of the student to cope successfully with
demands of secondary education may lead some of these junior high school casualties into the delinquent sub- 
culture, which has been represented by subjects used in 
this study. An awareness of school problems that often 
lead to delinquency has led the Colston Facility to place 
strong emphasis on educational rehabilitation. For more 
detailed information of this population's scores on 
standardized tests see Appendix Tables 4, 5, 6 & 7. 

When pairs of subjects were selected based upon comparable IQ, reading pretest scores, Essential Vocabulary 
pretest scores and variables such as age, sex, ethnic 
background, socio-economic status, classroom setting, 
and teacher were controlled, the Multi-modality treatment 
appears to have been an aid in facilitating students 
learning of the Essential Vocabulary. Students showed 
statistically significant gains over the Phonics group 
when post tested on the Essential Vocabulary List. This 
result was in accord with the researchers hypothesis. 

Essential Vocabulary Bingo cards had to be broken 
down into two sets of game cards, because the pay off 
rate of Bingos was much higher for 36 pals than it was 
for 115 Essential Vocabulary Words. This change was 
made after the first week we played the Essential 
Vocabulary game. Students in the Multi-modality group 
were reported by the staff to have practiced for the 
Essential Vocabulary game on Friday. Some of them wrote
down the words they needed to learn from the Language Master Cards and requested that the staff ask them these words. Subjects were also reported to have located these words within their environment. It was stated to the researcher that some of the subjects had asked what other words grouped with the familiar Essential Vocabulary word had said. Perhaps having been able to have located the Essential Vocabulary words in an environmental context accounts in part for increased scores on the Gates-MacGinitie that were received by the Multi-modality group.

The Formula Phonics group was not reported to have been seen practicing outside of the classroom. Phonics instruction must be questioned as the preferred form of remedial treatment for secondary level reading disabilities. Students who have not learned to read before they have reached secondary grades may feel defeated from prior failure experiences that utilized some form of phonics instruction. Some subjects who received the Multi-modality treatment may have been more motivated by this method treatment, because students at the secondary level frequently were heard to complain that phonics lessons were kids stuff. The association between phonics instruction and elementary education may have been a problem in motivation and in self esteem. Learning real words may have seemed more grown up and therefore was probably less threatening to their egos.
Some of the students studied, due to brain damage, as was indicated by the medical section of their court reports, may not have been able to put sounds together to form words. Perhaps some of these students needed a whole word approach that used words that already had contextual meaning. Meaning from printed symbols in some of the cases studied, was perhaps facilitated by meaning already having been associated with the words appearing on the Essential Vocabulary List.

It has been observed by this researcher that some students responded to words on the WRAT test by telling the examiner, "I can't say the word but I can tell you what it means." If reading means the ability to obtain meaning from printed symbols some of the subjects read more words than they were able to pronounce. It was also observed that some students were able to pronounce words that they had never seen before, "Did I get that one right? I've never seen it before. What does it mean?" These observations have led this researcher to be cautious about reading disabilities that have been diagnosed that employed a single instrument of measurement.

The Language Master approach is not for everyone. Some problems were noted by this researcher. Not all students can be trusted to make proper use of the equipment. Some students enjoyed pushing the student record button and recording words frequently labeled as obscene
on the Language Master Cards, and others preferred to listen to what the other students said rather than listen to the instructor tape. The listeners also failed to make the correct word response on the student tract. For the Language Master to have the desired effect it must be closely monitored and students should not be put on it for an extended period of time in any given setting.

Conclusions

The Language Master can be an effective tool when combined with a learning game and positive reinforcement. Students who received the Multi-modality instruction appeared to have made greater reading gains than the phonics group on one of the standardized postests.

Directions for Future Research

The Essential Vocabulary Bingo game and the Language Master should be separated and evaluated independently. The Bingo format has reportedly done very well in the math and social studies program. Students who are in regular public school classes and have access to candy machines may not be as motivated as students who do not have access to candy.
SUMMARY

School problems, such as a serious reading deficiency can often lead to behavior problems. Students with behavior problems were referred by the court to the Colston Youth Center, where they received a battery of diagnostic tests. 64% of the population received reading scores on or below 6th grade level. 30% were identified as learning disability students, by the schools they had formerly attended. From a population of 286 disabled readers referred to the reading specialist for two 45 minute periods of reading instruction per day a comparable sample of 15 pairs was selected. One group was given Formula Phonics treatment and the other group was given Multi-modality treatment, using a Language Master. After data had been gathered and analyzed. The Multi-modality group was found to have made greater gains significant at .01 level in learning the Essential Vocabulary and showed greater gains significant at .05 level on the Gates-MacGinitie postest. The Formula Phonics group did slightly better than the Multi-modality group when posttested on the reading section of the WRAT but their increases did not reach statistical significance at the .05 confidence level. It was therefore concluded that disadvantage readers showed greater improvement when they were given remedial treatment more typically resembling methodology utilized in Special Education classes.
than they did from more traditional forms of instruction.
APPENDIX

Table 1

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retardation (70 and below)</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>Below Average (72 - 80)</td>
<td>117</td>
<td>26</td>
</tr>
<tr>
<td>Low Average (88 - 95)</td>
<td>110</td>
<td>25</td>
</tr>
<tr>
<td>Average (96 - 103)</td>
<td>59</td>
<td>13</td>
</tr>
<tr>
<td>High Average (104 - 111)</td>
<td>37</td>
<td>8</td>
</tr>
<tr>
<td>Above Average (112 - 127)</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Superior (128 and above)</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Missing Cases</td>
<td>81</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 2
Central Tendencies on Intelligence Tests for the Population and Sample

<table>
<thead>
<tr>
<th>POPULATION</th>
<th>RESEARCH SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>88</td>
</tr>
<tr>
<td>Median</td>
<td>89.5</td>
</tr>
<tr>
<td>Mode</td>
<td>89</td>
</tr>
<tr>
<td>Range</td>
<td>139-54</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RESEARCH SAMPLE</td>
</tr>
<tr>
<td>Mean</td>
<td>84.2</td>
</tr>
<tr>
<td>Median</td>
<td>85</td>
</tr>
<tr>
<td>Mode</td>
<td>tr modal</td>
</tr>
<tr>
<td>Range</td>
<td>93-74</td>
</tr>
<tr>
<td></td>
<td>89, 82 &amp; 81</td>
</tr>
</tbody>
</table>

Note IQ scores on the WISC & Otis were compared using a handy sample (all subjects on whom both sets of scores were available) N=20 r=.915.
Table 3

Chronological Composition of Colston Population

<table>
<thead>
<tr>
<th>Age upon Commitment</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 and under</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>67</td>
</tr>
<tr>
<td>14</td>
<td>116</td>
</tr>
<tr>
<td>15</td>
<td>112</td>
</tr>
<tr>
<td>16</td>
<td>103</td>
</tr>
<tr>
<td>17</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 4

Ethnic Composition and Test Performance

<table>
<thead>
<tr>
<th></th>
<th>White 56%</th>
<th>Hispanic 42%</th>
<th>Black 2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>number admitted</td>
<td>250</td>
<td>188</td>
<td>10</td>
</tr>
<tr>
<td>completed program</td>
<td>228</td>
<td>170</td>
<td>9</td>
</tr>
<tr>
<td>X on Gates pre test</td>
<td>6.6</td>
<td>5.25</td>
<td>4.4</td>
</tr>
<tr>
<td>X on Gates post test</td>
<td>7.8</td>
<td>6.05</td>
<td>6.1</td>
</tr>
<tr>
<td>X on WRAT Math pre test</td>
<td>6.46</td>
<td>5.08</td>
<td>4.36</td>
</tr>
<tr>
<td>X on WRAT Math post test</td>
<td>7.9</td>
<td>6.8</td>
<td>4.99</td>
</tr>
</tbody>
</table>

Table 5

Population Scores Reading and Math Tests

<table>
<thead>
<tr>
<th>POPULATION</th>
<th>READING</th>
<th>MATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test N=448</td>
<td>5.98</td>
<td>5.7</td>
</tr>
<tr>
<td>Post test N=425</td>
<td>7.02</td>
<td>6.42</td>
</tr>
</tbody>
</table>

Mean Scores for the Colston Population 1976-1978

*Reading scores are based upon an average of the Accuracy, Vocabulary, and Comprehension Sub-test on the Gates.
Table 6
Population Breakdown According to Grade Level on Gates-MacGinitie Pretest

<table>
<thead>
<tr>
<th>Grade level</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and below</td>
<td>36</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>67</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>76</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>59</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>8</td>
<td>31</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>12 and up</td>
<td>13</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note these scores are based upon an average of the accuracy, vocabulary, and comprehension subtests. A subject, based upon his averaged score, can come out with a total score below grade three. Title I requires that testing results be reported as single scores based upon averaged subtest scores, although this practice is not in accordance with the Gates-MacGinitie Reading Test Manual.*
Table 7

Breakdown on Mean Scores on the Gates-MacGinitie Reading Subtests 1977-1978:

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Speed</th>
<th>Accuracy</th>
<th>Vocabulary</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>176</td>
<td>7.07</td>
<td>6.41</td>
<td>6.7</td>
<td>5.14</td>
</tr>
<tr>
<td>Postest</td>
<td>138</td>
<td>7.78</td>
<td>7.27</td>
<td>7.71</td>
<td>6.40</td>
</tr>
<tr>
<td>Gain</td>
<td></td>
<td>.71</td>
<td>.36</td>
<td>1.91</td>
<td>1.26</td>
</tr>
</tbody>
</table>
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