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A Supplementary program of visual perceptual activities for the identification and remediation of specific reading problems to be utilized by teachers of the primary grades with learning disabled children

Patricia A. Bennett

A SUPPLEMENTARY PROGRAM OF VISUAL PERCEPTUAL ACTIVITIES FOR THE IDENTIFICATION AND REMEDIATION OF SPECIFIC READING PROBLEMS TO BE UTILIZED BY TEACHERS OF THE PRIMARY GRADES WITH LEARNING DISABLED CHILDREN

by

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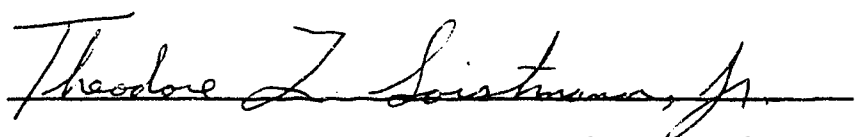

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A Project Submitted in Partial Fulfillment of
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The Problem

The purpose of this study was to investigate the theories, methods, materials and suggestions offered by authors and school systems with existing programs in the area of visual perception, and to interpret the findings, thus suggesting a supplementary program that could be utilized by the primary classroom teacher for the improvement of reading for children with visual perceptual problems. Specifically, the following information was sought: (1) Theories and educational philosophies of diverse authors concerning the nature and treatment of visual functioning and learning; (2) A list of characteristics that could be used as guidelines by the classroom teacher for the identification of children with learning disabilities and visual perceptual or reading problems; (3) A suggested list of tests for remedial diagnosis so that an individualized remedial program for each child could be prescribed; (3) Methods, materials and suggestions used or recommended by researchers, specialists, school systems or authors in the field of visual perception and reading, to help children with these particular type problems; (5) The educational, developmental or psychological changes noticed in children participating in pilot study research designs and existing programs in school systems having classes set up for children with these particular type problems. Where

available the statistical analysis of success that was measured because of using these methods, materials and suggestions was presented.

Procedures

Data from research studies were secured from libraries, conferences, personal reference material, state education departments, the Eric System, periodicals, books and any other sources where pertinent information was available. Letters were sent out to authors and school systems explaining this study and requesting the following information: (1) Methods and procedures used to help children with visual perceptual and reading problems; (2) educational, developmental and coordinational, and psychological changes noticed in the children by using these procedures as seen by the teachers or authors; (3) statistical analysis of success measured because of using these procedures, if available.

Major Findings and Conclusions

1. One in every fifteen children in the nation's schools identified as normal in sensory, physical and intellectual attributes were not progressing academically in accordance with their potential.

2. Some children had normal sight who were found to have visual-perceptual and reading problems. Vision was a part of perception and reading was a very complex perceptual, cognitive, and affective task which relied primarily on the visual process. Vision developed maximally between the ages

of three and seven years in some ordered, developmental sequence.

3. The findings of the pilot research designs in this study showed that the primary classroom teacher could successfully identify and remediate children with visual-perceptual and reading problems. The findings of the pilot research designs showed that training in bodily parts, right-left awareness, tactile, kinesthetic, visual and auditory perception, and language did help children to mature developmentally, increase their attention span, increase their competence in visual perception, achieve academically and increase in their performance of reading skills.

4. Many children in the nation's schools identified as normal were not achieving to their potential due to the lack of qualified teachers and adequate programs for the identification and remediation of visual-perceptual handicapped children. The problems that the children not working up to their potential encountered affected their academic growth in writing, spelling, arithmetic and particularly reading, and also their social and emotional development.

5. Since children spent a good share of their time in the primary classrooms during the formative stages of visual perception, the responsibility for the essential development of visual perceptual and reading skills would seem to fall upon schools and particularly the primary classroom teacher.

6. In identifying and remediating children with visual-perceptual and reading problems, the "whole child,"

his sensory integrity, health, neurological integrity, intelligence, language, home environment, educational background and achievement, personality, motivation, his learning patterns and other aspects of behavior should be considered.

7. The services of other professionals who were specialists in a given field were sometimes important for a more complete diagnosis and remedial program.

8. The curriculum techniques in the primary classrooms needed modification for the identification and remediation of children with visual-perceptual and reading problems.

9. The personality and attitude of the primary classroom teacher and the classroom environment were important factors in the rehabilitation of children with visual-perceptual handicaps.

ACKNOWLEDGMENTS

The writer was fortunate in having such a knowledgeable man as Dr. Theodore L. Soistmann for an advisor and would like to express her sincere gratitude for the time and effort he took in giving the guidance and encouragement needed for fulfilling such a meaningful project.

Acknowledgment is greatly extended to the members of the faculty of Walden University who assisted the author in the early stages of this project, and especially to Dr. Joseph Carol for his understanding and assistance in the final stages of the project.

Appreciation is expressed to all individuals and school systems who cooperated in replying to the writer's requested information and for their suggestions concerning this investigation.

The writer would like to thank Dr. George Esper and Dr. Harvey Sokolow for their helpful suggestions and guidance.

Special thanks and appreciation are extended to the writer's husband, Richard, who gave her the incentive, motivation and perseverance for accomplishing this project and without whose assistance and understanding would not have been able to fulfill these goals.

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CHAPTER I

INTRODUCTION

Programs for handicapped children such as the mentally retarded, the physically handicapped, the deaf, the blind, have existed as a part of most school systems. Diagnosis and remediation for these children have been recognized and accepted by most educators.

There have been, however, children in our schools who have had learning problems which have not fit into the above categories. Many of these children appeared to have visual or auditory perceptual problems; memory problems; problems of information processing, concept formation and problem solving; and problems of oral and written expression. These children were not developing normally and to their full capacity, not only intellectually, but also in the different academic subject areas such as writing, spelling, arithmetic and reading. This group included children with various psychological and educational developmental deficiencies but who were identified as normal in sensory, physical, or intellectual attributes, as measured by standardized testing procedures.

Attention to the seriousness of this problem in the nation's schools was expressed in a statement by Betty Smith

Cline, Coordinator for Special Programs in the Fayetteville, North Carolina City Schools.

> One in seven elementary schoolchildren (and one in four large city elementary schoolchildren) requires special attention to keep up with his classmates in reading. A typical classroom will contain from one to three children whose academic progress is not in keeping with their abilities, which may be superior. The cause of this poor performance springs from long unrecognized educational problems called specific learning disabilities. At least one in every fifteen children in our nation's schools is handicapped in this way.[1]

The writer believed that it was imperative at the outset to define and describe the term 'specific learning disabilities.' There has been difficulty in composing an inclusive and universally acceptable definition of this term. The Kirk definition seemed to be one accepted and preferred by many educators.

> A LEARNING DISABILITY refers to a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural or instructional factors.[2]

The term 'learning disability' has not been used as a diagnosis in the usual sense, but rather as a short cut way of saying that these children have trouble learning some things, but not all things.

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[1]Betty Smith Cline, "Specific Learning Disabilities," Today's Education--NEA Journal (January, 1972), 19.

[2]Samuel A. Kirk and Barbara Bateman, "Diagnosis and Remediation of Learning Disabilities," Exceptional Children, XXIX (October, 1962), 73.

The learning disabled child has usually been known to have perceptual problems and has not been able to receive or to gain meaning from sensory information in a normal manner. Both Wold and Spache have emphasized that if he was not able to read well, he would likely have visual perceptual handicaps. Many elementary pupils could not consistently distinguish between "was" and "saw," and "p" and "b," "their" and "there"; lost their place while reading; omitted words, and changed words' beginnings or endings. He could be very slow in building a basic reading vocabulary. He could know a word one day but be unable to recognize it the next day. His eyes could fixate excessively somewhere on the line or there could be regressive eye movements.[3]

Without question, the role of the visual-perceptual process in the reading task has been shown to be extremely complex. Children have been known to have normal 20/20 sight and yet still be severely handicapped by visual disorders.[4] Dr. G. N. Getman, formerly the Director of Child Development at the Pathway School, located in Jeffersonville, Pennsylvania and responsible for much of the developmental child-centered school philosophy, defined vision as:

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[3]Robert M. Wold, Visual and Perceptual Aspects for the Achieving and Underachieving Child (Washington: Special Child Publications, Inc., 1969), p. 16; and George D. Spache, Reading in the Elementary School (Boston: Allyn and Bacon, Inc., 1964), pp. 8-9.

[4]Baxter Swartwout, "Educational Visual Training Programs," Academic Therapy Quarterly, VII (Fall, 1971), 87.

> The process by which a child interprets and responds to his world, the objects and the academic, cultural and social tasks within this world . . . what he sees, how he sees it, how he interprets what he sees, and the speed and skill of visual recognition will determine the majority of his responsive activity.[5]

Dr. Stanley Abelman, Supervisor of Visual Development at the Pathway School, summed it up very clearly with the following comment:

> Vision, in short, is giving meaning to seeing. Since eyeballs are not capable of determining size, color, shape, texture, or distance, we must learn to get meaning from what we "see" only through repetitive explorations at different developmental stages, usually all of the available learning systems to build our warehouse of experience.[6]

The child, who has entered the reading arena with a maturationally undeveloped visual integrative system, could be predestined to fail, according to Abelman.[7]

Reading seems to have been universally accepted as primarily a visual process, according to many investigators. With increasing frequency, school-oriented remedial programs for underachieving children have demonstrated a growing awareness of the roles of vision and movement in learning and in the development of learning problems. The sheer magnitude of the reading problem and the shattering impact of reading disability on the personal and vocational future of the child should command

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[5]Stanley Abelman, "A Love Story--The Joys of Learning," The Pennsylvania Optometrist, XXXI (May-June, 1971), 4.

[6]Ibid., pp. 4-6.

[7]Ibid., p. 5.

the highest priority of educators.[8]

The U.S. Commissioner of Education proclaimed that: ". . . there is no higher nationwide priority in the field of education than the provision of the right to read for all . . ."[9]

Clements perceived that without the continued growth and development of school oriented visual-training programs, thousands of children may continue to be limited in the development of their mental and intellectual potential. Many school systems have just begun to implement programs for children with visual perceptual problems. In other school systems, neither regular classes nor any existing special classes have provided the school environment and special teaching methods required for the education of such a child. Unfortunately, by the time many of these children have reached the latter part of the first grade or second grade, some educators have recognized that the children were not progressing in academic skills at the expected rate, but they have not known why or what to do about it.[10]

At a symposium for the Annual Forum of the National Conference of Social Welfare, held in Dallas, Texas, in 1967,

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[8]James E. Allen, Jr., "The Right to Read--target for the '70s," Journal of Reading, XIII (November, 1969), 95-101; and Cline, op. cit., p. 22; Wold, op. cit., p. 16.

[9]Allen, Ibid., p. 95.

[10]Sam D. Clements, "Minimal Brain Dysfunction--The Problem" (speech at the Annual Forum of the National Conference on Social Welfare, Dallas, Texas, 1967) (Chicago: National Easter Seal Society for Crippled Children and Adults, 1968), pp. 1-2, 6.

Dr. Sam D. Clements spoke and pointed out the outcome of placement for many of these children in our school systems.

> Some of these children are relegated to the special education classroom designed and operated for the mentally retarded; others are retained in grade for a year or more in the belief that they will "catch up"; some are tutored incorrectly for months on end with no appreciable gains in skills; most are passed along automatically with their age group through the mechanism of "social promotion," even though it is known that the child cannot compete academically or socially with his peers.[11]

When special classes have been available, such as a special reading class, the children have sometimes been placed there, in hopes that the solution to the problem may lie there. Very often, however, opportunity for the diagnosis and remediation of these perceptually handicapped children has not been afforded, either because it was not available due to the lack of appropriate programs and qualified teachers or because of the busy schedule of the remediation teacher.[12]

Sapir believed that the field of learning disabilities was a comparatively recent one, and that the average classroom teacher probably had not trained in the diagnosis and remediation of this type of problem. Fortunately, teachers have become more aware of the children who possess visual perceptual problems and have realized that a different type of program was needed in order that these

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[11] Ibid., p. 1

[12] Ibid., pp. 6-7.

children reach their potential intellectually.[13]

Because of the crisis of this situation, one professional group that has been present in the public schools in sufficient numbers and that could assist in the remediation of the large number of children needing service was the regular classroom teacher. The writer envisioned the possibilities of adapting, modifying and applying procedures in the primary classrooms to aid the teachers in the remediation of these learning disabled children. The intent of this study was to provide a suggested supplement of activities in the area of visual perception for the improvement of reading which could be utilized by the classroom teachers for children with learning disabilities.

I. The Problem

The purpose of this study was to investigate the theories, methods, materials and suggestions offered by authors and school systems with existing programs in the area of visual perception, and to interpret the findings, thus suggesting a supplementary program that could be utilized by the primary classroom teacher for the improvement of reading for children with visual perceptual problems.

Specifically, the following information was sought:

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[13]Selma G. Sapir, "A Pilot Approach to the Education of First Grade Public School Children with Problems in Bodily Schema, Perceptual-Motor and/or Language Development" (Scarsdale, N.Y.: Columbia University and Union Free School District No. 1, April, 1967), pp. 38-39.

1. Theories and educational philosophies of diverse authors concerning the nature and treatment of visual functioning and learning;
2. A list of characteristics that could be used as guidelines by the classroom teachers for the identification of children with learning disabilities and visual perceptual or reading problems;
3. A suggested list of tests for remedial diagnosis so that an individualized remedial program for each child could be prescribed;
4. Methods, materials and suggestions used or recommended by researchers, specialists, school systems or authors in the field of visual perception and reading to help children with this particular type of problem;
5. The educational, developmental or psychological changes noticed in children participating in pilot study research designs and existing programs in school systems having classes set up for children with these particular type problems. Where available the statistical analysis of success that was measured because of using these methods, materials and suggestions was presented.

II. Importance of the Study

This study evolved as a direct result of the writer's recent position, which was that of a corrective reading teacher. From the writer's experience, she became aware that the Title I Reading Program that she conducted was becoming one of a so-called "dumping ground."

Among the criteria for the selection of children for inclusion in the program were that they have average or near average intelligence, which was determined by standardized intelligence tests, and that they were reading below grade level. According to standardized reading and achievement tests and conferences with the classroom teacher, it became apparent that many of the children selected were making little or no progress over a one to three year period. The concern of the school psychologist, along with the writer's own disappointment and concern, led her to explore what the underlying cause for the lack of achievement could be. Through diagnostic evaluation of these children, including medical and behavioral assessment, specific areas of cognitive and perceptual deficits were disclosed which formed the basis for a reeducational program.

Concerning this problem Johnson stated that the number of such children in schools has been much greater than was generally supposed, and in far too many cases their real needs have gone undiscovered. Consideration should be given to the relative impact of a disability on various forms of learning and behavior. For example, reading disabilities have affected written language. Problems of

visual memory have often affected reading and spelling, but very often have also interfered with revisualization of numbers and other symbols.[14]

In taking a closer look at the perceptually handicapped child and his problems, it has been found that in many cases school has been a traumatic experience. This has been especially true of the child with average intelligence who entered school with high hopes, coupled with the usual apprehension. He soon discovered that his peers were more successful than he in learning to read, write, spell and solve arithmetic problems. Failure of the child to achieve in the average classroom situation and to interact successfully with his peer group may cause great damage to the child's self-concept. The results could be isolation from effective cooperation or competition in human affairs.[15]

The learning disabled child has been known to be hyperkinetic and have a short attention span which has not been conducive to learning the skills of reading. Wold said:

> A child who cannot read becomes a frustrated child. When the demands on him increase and he remains unable to cope with them, more often than not he will seek other ways to gain recognition (sports, mechanical endeavors, delinquency, etc.) It is no wonder that better than 90 per cent of our juvenile offenders also exhibit significant and often severe

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[14]Doris J. Johnson, "Educational Principles for Children with Learning Disabilities," Rehabilitation Literature, XXVIII (October, 1967), 318-20.

[15]Sylvia O. Richardson, "Learning Disabilities" (speech presented for the Association for Children with Learning Disabilities at the White House Conference, Pittsburgh, Pa., 1970), pp. 13-14.

reading problems.[16]

Recent attention was focused on the correlation between learning problems and delinquency at a meeting held in February, 1972 in Atlantic City, sponsored by the Association for Children with Learning Disabilities. An article entitled "Experts Now Link a Learning Disorder to Delinquency" appeared in the New York Times Sunday edition and stated:

> Several new studies described at the meeting indiated that as many as 80 per cent of delinquent boys may have begun their downhill ride in society with a potentially correctable learning problem.[17]

Johnson, in a speech at the White House Conference, intimated that a child of this type presented a serious emotional, social and educational problem which could remain with him for the rest of his life.[18]

Perhaps one of the most tragic and most difficult problems faced has involved the youngsters who have not been reached until they have become adolescents. Clements said:

> We can only speculate as to what happens to children where public and professional education on this topic is behind the times, and where adequate diagnostic facilities are not available.[19]

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[16]Robert M. Wold, "Vision and Learning: The Great Puzzle--Part II," The Optometric Weekly, LXII (October, 1971), 32.

[17]New York Times, February 13, 1972, p. 46, col. 1.

[18]Doris J. Johnson, "Educational Programming for Children with Learning Disabilities" (speech presented for the Association for Children with Learning Disabilities at the White House Conference on Children and Youth, Pittsburgh, Pa., 1970), p. 30.

[19]Clements, op. cit., p. 6.

By the time a child arrived at the junior high school or the high school level, he had many years of persistent confusion and frustration to which he reacted in a variety of ways. There might have been a tremendous overlay related to his primary reading disability. He may not have been able to read warning signs, fill out application forms for employment, or use telephone books for emergencies. In many cases some had already dropped out of school because of the failure, frustration, and misunderstanding they had endured through their academic life.[20]

It has been extremely important not to let the early difficulty with reading persist and to move in and help those children who were having trouble as early as the first months of Grade I. The importance of reading and reading ability as prerequisites to academic achievement were cited by Wold: "If a child cannot read, his learning rate and efficiency reduces dramatically each year from grade four on."[21]

Wold's concern for the outcome of children with reading problems was illustrated in the following statement:

> Close to 90 per cent of children with reading problems are lost in space. They are confused with left and right; they are confused about time. They don't follow even the simplest sequence of instructions. They can't organize their thoughts and actions into a normal sequence. They don't function in an organized left to right approach to

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[20]Johnson, "Educational Principles," p. 319; and Clements, loc. cit.

[21]Wold, "Vision and Learning," p. 32.

> paper-pencil tasks. They just can't cope with their complex world even though it is seen with clarity.[22]

According to O'Donnell, reading has been known to be a process which requires integration of auditory and visual information. The letters of the English language were phonic in nature; they represented sounds. Also, the written word (visual) was a symbolic representation of the spoken word (auditory). Adequate processing of auditory and visual information would seem to be basic prerequisites to reading.[23]

"Gesell states that the infant holds the world with his eyes long before he holds it with his hands."[24] Visual perception, as defined by Frostig (ability to discriminate and identify visual stimuli), developed maximally between the ages of three and seven years, with little growth after about nine or ten years of age.[25]

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[22]Ibid.

[23]Patrick A. O'Donnell, "Delacato Training for Reading Achievement and Visual-Motor Integration," Journal of Learning Disabilities, II (September, 1969), 10; and Marianne Frostig, "Visual Perception, Integrative Functions and Academic Learning," Journal of Learning Disabilities, V (January, 1972), 6; and Harold J. McGrady and Don H. Olson, "Visual and Auditory Learning Processes in Normal Children and Children with Specific Learning Disabilities," (study sponsored by U.S. Office of Education, Bureau of Research; Evanston, Ill.: Northwestern University, 1967), p. 5.

[24]Mavis Welch Morgan, The Effect of Visual Perceptual Training Upon Subsequent Scholastic Progress of Children with Specific Visual Disabilities (Duncan, Okla: Optometric Extension Program Foundation, Inc., 1966), citing Arnold Gesell, Vision: It's Development in Infant and Child (New York: Harper Brothers, 1949), p. 59.

[25]Marianne Frostig and Phyllis Maslow, "Reading De-

"There is cognition of the importance of vision at this developmental stage when we ascertain that more than eighty per cent of all school tasks are visual."[26] Since a child has spent a good share of his early years in the classroom, it should be the responsibility of every classroom teacher to attempt to develop the visual, perceptual and integrative skills necessary for efficient learning during this formative period of a child's life. Once the tools have been developed, learning can, and usually does, take place.[27]

Vision must be as close to maximum in performance as possible if the student is to participate totally in any program of modern educational demands. A child may not have always been able to gather information from other sources such as taste, tactile, or auditory, to have interpreted all situations that confronted him. He often made judgments through his visual interpretations alone. Therefore, mistakes or incompletions in vision were of vital significance since children grew up in a world that demanded more of

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velopmental Abilities and the Problem of the Match," Journal of Learning Disabilities, II (November, 1969), 23, citing J. Piaget, "Six Psychological Studies."

[26]Morgan, op. cit., p. 2, citing G. N. Getman, How to Develop Your Child's Intelligence (Luverne, Minn.: Privately Published, 1962), p. 18.

[27]Sapir, op. cit., p. 43; and William Cruickshank, "Educational Planning for the Perceptually Handicapped Child," (speech made at the Perceptually Handicapped Children's Association, Winnetka, Ill., January, 1971), p. 3.

vision than any of the other sense modalities.[28]

Providing educational opportunities and services for children with visual perceptual problems has become one of the most challenging problems confronting public educators today. The basic philosophy underlying the education for these children should be no different from that for all children, because these children have been more like all children than different. The fundamental aim of all education has been to teach children to live wisely and well in their environment and to become useful citizens.[29]

Cruickshank made the following statement at the January, 1971 meeting of the Perceptually Handicapped Children's Association in Winnetka, Illinois:

> The learning disabilities field is probably as big as the whole field of mental retardation, emotional disturbance and speech problems put together. In my opinion every classroom has from one to four LD children in it. Most of the work with these children must go on in the public schools.[30]

There has been great controversy among the educators as to whether a perceptually handicapped child should remain in the regular classroom, be placed in a special classroom, or have remained in the regular classroom but be taken out

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[28]Morgan, op. cit., p. 2.

[29]Mary Burg, Handbook for Teachers of Children with Specific Learning Disabilities (Ohio: Hamilton County Public Schools, 1969), p. ii.

[30]Cruickshank, op. cit., p. 3.

each day for an hour or more to receive instruction from a teacher trained in learning disabilities. With the present shortage of special learning disability teachers and programs, it would seem feasible that the classroom teacher alter the curriculum and provide a program adaptable for the remediation of the perceptually handicapped child.[31] Apparently, many school systems have no other choice than to do this if they are going to provide opportunity for the perceptually handicapped child to achieve his potential.

McCarthy made the following comment which seemed most appropriate:

> The overall educational impairment of such a child, as a general rule, requires procedures not available in the normal classroom but is usually not of sufficient magnitude to warrant special class placement. In addition, a learning disability is usually not as generalized as other, more clearly identifiable disabilities. Instead, it is often limited to specific areas of the classroom performance and/or certain behavioral manifestations that occur under given circumstances.[32]

The classroom teacher would seem the appropriate person to make the original identification of a child with learning difficulty. She might have sensed that there was something different or perhaps something wrong with this particular child's approach to learning.[33] The results of

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[31]Natalie E. Patterson, "Multi-Sensory Approach to Reading Disabilities" (Lexington, Ky.: Fayette County Public Schools, 1968); and Johnson, "Educational Programming," p. 27.

[32]McCarthy and McCarthy, Learning Disabilities (Boston: Allyn and Bacon, Inc., 1971), p. 7.

[33]"Learning Difficulties" (Louisville, Ky.: Jefferson County Board of Education, 1969), p. 2.

a study done by the Rocky Mountain Educational Laboratory showed that teachers could accurately identify children in their classrooms who were having learning problems by using an approved Classroom Screening Instrument.[34]

The classroom teacher has always been an integral part of the pupil's school environment. Planned properly, the classroom atmosphere could be just the setting that helped the child learn to orient himself, distinguish figure from ground, assimilate and integrate the simultaneous and sequential sensory input. A teacher who was working with a child on a reading program could instruct at the child's performance level but also be aware of reading content of motivational interest and deal with his feelings of anxiety and despair about reading. Ongoing communication among the various professionals who knew the child could share information and experiences, pool ideas and develop new approaches together.[35]

Throughout the New Jersey School Systems, discussion among the professional staff and referral to research studies in the area of remediation strongly underlined the need

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[34]Willard G. Jones, "Pilot Incidence Study, A Report Prepared by the Rocky Mountain Educational Laboratory, under Contract with the U.S. Office of Education, Bureau of Research (Greeley, Colo.: Rocky Mountain Educational Laboratory, Inc., August, 1969), p. 1.

[35]G. E. Blom, The Need for a Multi-Dimensional Approach to Learning Disabilities, A Report Prepared for a Multi-Disciplinary Symposium on Dyslexis and Associated Learning Disabilities, Valparaiso University, Indiana, May, 1968 (New York: Grant Foundation, 1968), p. 14.

for services that would affect the climate of learning in the classroom. With the help of a Learning Disabilities Specialist, programs were set up in the regular classroom which proved most successful. The following comment about the program's success seemed justifiable:

> The fact that "remediation of instruction" had been included as an integral part of the classroom, made it understood that the whole child was embraced in his total curriculum rather than be limited to corrective lessons in one academic area and isolation from the regular class and its teacher.[36]

In another study carried out in the Fayette County Public Schools, in Lexington, Kentucky, children diagnosed as having learning problems received a highly structured language arts, motor training, and a rhythm and patterning program while remaining in their usual classroom. Patterson expressed the results of the experiment:

> The importance of this experiment with curriculum lies in the fact that a successful attempt was made to alter the curriculum instead of the child and that this was accomplished without the employment of additional staff or area specialists. It was accomplished without major disruption of the existing school structure. The new-found ability to reach the previously unreachable child was ample reward for the effort of each staff member. Needs identical to those found in our student population exist in every school district. What was done here can be done anywhere if the desire is great enough.[37]

The concluding remarks of Morsink, who did a similar study, were in agreement with this philosophy:

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[36]James Jan-Tausch, "The Learning Disabilities Teacher," (paper presented at International Reading Association Conference, Boston, Mass., April, 1968), p. 2.

[37]Patterson, op. cit., p. 7.

> An ordinary teacher can do a great deal to help an "unreachable" child. The teacher needs to observe the strengths and learning needs of the child, to outline the objectives of special help in specific terms, and to break down these objectives into small, reachable steps. By reinforcing correct responses and revising those procedures which do not prove effective, the teacher can gear the program to the child's individuality.
>
> Although the contributions to treatment of the multi-disciplinary diagnostic team are desirable, they are not mandatory. The "lack of expert help" should not become an excuse of inaction. Any teacher who cares enough to try can make a significant difference in the life of a "shadow child." There are too many handicapped children and too few experts for us to do anything less.[38]

Speaking of the "lack of expert help" should be reason enough to motivate any educator to re-examine and evaluate the educational system as far as the perceptually handicapped child is concerned. The fact that these children, comprising 15 per cent of the student population in any school, could not be successful in a normal learning situation no matter how hard they tried, should be sufficient to cause every school to examine its curriculum and methodology. We are hopefully meeting the needs of 85 per cent of our youngsters, and are missing the mark completely with 15 per cent of them.[39]

Clark and Richards, in 1968, conducted a national questionnaire survey, obtaining a 93 per cent response from the fifty states and three territories to which inquiries

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[38]Catherine Morsink, "The Unreachable Child: A Teacher's Approach to Learning Disabilities," Journal of Learning Disabilities, IV (April, 1971), 40.

[39]Patterson, op. cit., p. 3.

were sent. Of those responding, thirteen states reported having classes for children with learning disabilities. This, the investigators estimated, represented about 600 programs in the nation. If the present prevalence estimates of learning disabilities were even close to accurate (five to ten per cent of the school age population), then one must conclude that only a minute portion of those children requiring special provisions were receiving them.[40]

During the past ten years it has become increasingly clear that teachers and administrators of children with learning problems had little awareness and few of the skills needed to be helpful to such children. Dr. Samuel Kirk, a Psycho-Educator and professor in the Special Education Department of the University of Arizona, stated at the International Association for Children with Learning Disabilities Convention at Fort Worth, Texas:

> It is always surprising to me to find how far ahead the northern suburban area of Illinois is in the field of learning disabilities compared to the rest of the country. The cities are far behind the suburban areas in all states. Most of the cities have not begun any kind of programs in L. D. While some of the states are still identifying this child, we're ready for new methods and techniques for training the deficits.[41]

Illinois had well planned programs for children with learning disabilities, of which five were personally observed by the writer in Evanston in November, 1971. Each

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[40]McCarthy and McCarthy, op. cit., p. 87.

[41]Samuel Kirk, Speech at the International Association for Children with Learning Disabilities, Fort Worth, Texas, 1970.

teacher of children with learning disabilities had received special training at the graduate level and was qualified according to state approval.[42]

New York State has not progressed as rapidly in providing programs for these children. Teacher qualification requirements were the following, according to the New York State Education Department:

> Teachers shall be certificated as teachers of early childhood, elementary or secondary education having a minimum of one year's teaching experience and having taken course work in both reading and the handicap fields who in the judgment of the chief school officer possess the teaching experience deemed desirable for a teacher of children with "Learning Disabilities."[43]

From the statistical data shown here, it seemed evident that most states needed more and better trained teachers in order to qualify more adequately for teaching children with perceptual problems. Little in the traditional training of the school teacher has prepared them for the job of spotting, understanding, and doing something constructive about the child who needs special help. The etiology of learning disability might have been in one, or more likely, several different areas, and teachers were expected to recognize where the problem was. Therefore, teachers should be exposed to viewpoints of professionals

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[42]Illinois, Special Education Teacher Approval Procedures (rev. February, 1971; Springfield, Ill: State of Illinois, 1971), p. 23.

[43]New York, State Education Department, Division for Handicapped Children, Learning Disabilities Guidelines (Revised Preliminary Draft) (Albany, N.Y.: New York State Education Department, August 17, 1971), p. 3.

other than educators involved with children. Teacher training should include a thorough grounding that provides more than Freudian psychology. Every teacher should be acquainted with enough developmental neurophysiology to understand the theory underlying perceptual training.[44]

According to Clements, teacher training institutions have just begun to develop curricula to prepare teachers to work with the perceptually handicapped child.[45]

Sapir recommended a reevaluation of all teacher training programs with the introduction of some new courses on developmental principles and learning disabilities.[46]

The need for further research appeared to be self-evident. Because at this time, there have been no final answers to the problems of these children, emphasis should not be placed on any one approach or theory. Therefore, the general objectives should be experimentation in the areas of organization, materials, methods and techniques.[47] Since no provisions had been made in the area of visual perception and reading for children with learning disabilities in the school system where the writer had been employed, she envisioned this investigation as one step in filling the void

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[44]Alan Cohen, Teach Them All to Read (New York: Random House, Inc., 1969), pp. 101-102; and Margaret Bolick, "Learning Disabilities" (Toronto, Canada: Canadian Broadcasting Corporation, 1971), p. 7.

[45]Clements, loc. cit. [46]Sapir, op. cit., p. 39.

[47]Burg, loc. cit.

of knowledge to assist this school and others in bringing about improvements in education.

This study reported and analyzed the views of writers and the most recent methods in use for the remediation of these perceptually handicapped children. Hopefully, the results will inspire further investigation and research to be conducted and that other neighboring communities will set up programs as a preventative and remedial approach to serious academic disabilities.

Research has suggested that teacher training institutions should revise their programs to better train and qualify teachers as learning disability specialists. The following remark by Dr. William Cruickshank seemed most pertinent:

> A part of the national education crisis in special education . . . is to train college professors well, . . . or we are not going to crack this problem (the shortage of well trained teachers).[48]

If schools were to assume the responsibility for the education of all children, then the following comment by Johnson is true:

> Educational programs for children who have learning disabilities are not only justified; they are mandatory if we are to meet the needs of a rather large segment of the population. It is not enough to send these children through school and give them diplomas; they need to be educated in order to utilize their potential. Without appropriate habilitation, they may well be on school dropout lists, in juvenile courts, in mental hospitals, or on relief rolls. If their needs are met, they may become independent self-supporting citizens who feel a sense of personal worth and can contribute to society.[49]

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[48]Cruickshank, op. cit., p. 3.

[49]Johnson, "Educational Principles," p. 322.

III. Assumptions

The assumptions basic to the undertaking of the study were:

1. That the information received from school systems be honest and accurate within the limits of their perceptions;
2. That the children to whom this program be applied are screened and diagnosed as true learning disability cases, according to the definition cited by the writer. If no specialist is available to determine this, approved classroom screening procedures developed by authorities in the field of learning disabilities, such as Frostig and Clements, may be used as guidelines;
3. That failures not be due to mental retardation, emotional disturbances, lack of motivation, poor teaching or sensory deprivation;
4. That the children selected for this program have average or near average intelligence according to diagnostic intelligence tests. (There will usually be a discrepancy between the MA obtained on the intelligence test and the grade achievement scores);
5. That perceptual skills provide a foundation for higher order cognition;
6. That perceptual skills are acquired rather than innate functions dependent not only upon the integrity of the child's biological systems, but also the richness of his sensory-motor development as shaped by interactions

with his environment;

7. That reading is primarily a visual process and that children with learning disabilities usually do not possess certain perceptual and behavioral characteristics conducive to learning the skills of reading;
8. That deficiencies in this area affect the total academic achievement of the child and also his social and emotional behavior.
9. That many schools do not provide sufficient means for identification and remediation of the problems of children with visual perceptual and reading problems due to lack of specialists and programs in the field;
10. That the suggested supplement of this study will provide the basis for recommended changes in the reading curriculum of the primary grades of school systems.

IV. Limitations of the Study

In regard to this study, the following limitations were imposed:

1. Because the field of learning disabilities, as defined by this writer, has been recognized as such only within the past ten years, research studies and experimental designs available for analysis were limited;
2. The writer observed learning disability classes in Chicago and contacted many school systems and authorities in the field by letter, but due to a time element, was unable to make more personal contacts for observation

and evaluation purposes;

3. Due to a time element, an experimental design of the proposed plan could not be put into action, analyzed and evaluated;
4. This study was limited to visual perceptual problems and their relationship to reading.

V. Procedures

Data from research studies were secured from libraries, conferences, personal reference material, state education departments, the Eric System, periodicals, books and any other sources where pertinent information was available.

Letters were sent out to authors and school systems explaining this study and requesting the following information:

1. Methods and procedures used to help children with visual perceptual and reading problems;
2. Changes noticed in the children due to the use of these procedures as seen by the teachers or authors:
   a) Educational changes seen in the children;
   b) Developmental and coordinational changes seen in the children;
   c) Psychological changes seen in the children;
3. Statistical analysis of success measured because of using these procedures, if available.

VI. Definitions of Terms

Learning Disabilities. A motor, perceptual or cognitive deficit in a child identified as "normal" intellectually and in sensory and physical attributes, causing the child to be unable to achieve to his full potential intellectually, especially in writing, spelling, reading and arithmetic, and sometimes causing psychological and social problems. In this study a child with visual perceptual deficits was considered as being a learning disabled child.

Normal. Typical or average, according to a standard set of norms; free from disorders and distortions.

Visual perception. The ability to receive and understand visual symbols and their meaning.

Vision. "The comprehension of information that is gathered into the brain through the various sense modalities and the reconstruction of this information into a conceptual image that has meaning. It involves sight, perception, integration and conception."[50]

Sight or Visual Acuity. "To look at; to see; the measurement on the threshold of discrimination; the smallest letters or symbols seen at a specified viewing distance. The ratio 20/20 refers to the average sight at twenty feet, the upper number being the testing distance."[51]

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[50]Wold, Visual and Perceptual Aspects, p. 490.

[51]Ibid., p. 491.

VII. Organization of the Study

Chapter I outlined the problem and subproblems, importance of the study, basic assumptions, limitations of the study, procedures, and definitions of terms.

A review of related literature appears in Chapter II. The first section discusses theory and educational philosophies of diverse authors. The second section is concerned with the identification of the learning disabled child and the child with visual perceptual and reading problems. Section three is a review of the more recent methods and materials advocated for remediation of perceptually handicapped children.

Chapter III reviews a number of the more recent pilot study research designs and their results. This review is presented under the following major headings: studies involving school systems, and studies from literature pertinent to school systems.

A summary of theories and methods appears in the first section of Chapter IV. The second section of this Chapter is a suggested supplement of visual perceptual activities for the remediation of specific reading problems. Section three is a discussion of other factors that should be taken into consideration in remediating visual perceptual and reading problems.

Chapter V includes a summary of this study, its conclusions and recommendations for a visual perceptual program as an aid for the improvement of reading in primary classrooms.

CHAPTER II

REVIEW OF RELATED LITERATURE

The surge of interest in the area of visual perception and reading has been marked by the publication of numerous studies, theories, programs and remedies that could bewilder the classroom teacher. Further confusion has existed in attempting to evaluate the role of vision in learning and reading difficulties because the term "reading" encompasses a wide range of skills.

Research studies have indicated that there are many divergent points of view on the part of authors concerning the nature and treatment of the learning disabled child. In compiling the present review of literature, an attempt was made to collect some of the philosophies, methods, and ideas that have been formulated in the area of visual functioning and learning to read.

This review was divided into three main sections. The first section discussed theory and educational philosophies of diverse authors. The second section concerned the identification of visual and reading problems. The third section was a review of the more recent methods and materials advocated for remediation.

I. Theories and Educational Philosophies of Learning and Visual Perceptual Problems

Piaget has described in some detail the ontological development of the perceptual and logical operations which the child employed in structuring his universe. Piaget identified four stages:

> The sensori-motor period (birth to two years, approximately) is one in which the infant, at a reflex level in complete self-world totality, moves to the stage where his motor activities in relation to his environment show good organization. Notions that he develops through these events are based on actions but not thought. The pre-operational period, from approximately two to seven, is the stage when the child does not employ logical operations in his interactions with the environment, but rather he centers on only one aspect of an object or event at a time, on a single variable when he attempts to solve a problem. The concrete-operational period (7-11 years, approximately) is one in which the child's cognitive activities are much better organized than in the preceding stage. This has been achieved through the development of logical structure of groups because of some common attribute. The formal-operational period (beginning at age 11 or 12, approximately) is characterized by the ability of the youngster to control formal logic. While the concrete-operational child reasons only from directly-observed data, his older counterpart begins to deal with propositions and hypotheses apart from direct experience. He can determine the relevancy of variables and how these affect one another to produce a specific outcome.[1]

In relating Piaget's Stages to reading instruction,

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[1]Leo Manas, "Research Studies in Vision," Continuing Education Courses, XLIV (Duncan, Okla.: Optometric Extension Program Foundation, Inc., January, 1972), pp. 9-11, citing R. J. Raven and R. T. Salzer, "Piaget and Reading Instruction," The Reading Teacher, XXIV (1971), 630.

Piaget divided the preoperational period into two stages, preconceptual (age two to four) and intuitive (four to seven). In the first stage, rapid growth of language took place for most youngsters. During the intuitive phase, most children experienced initial reading instruction and the child moved from near-total dependence on perception to a greater reliance on thought to check what he saw.[2]

As early as 1947, Strauss and Lehtinen identified the behavior associated today with learning disabilities and mentioned motor activity as part of the remedial curriculum. However, it was not until Kephart and Barsch that the implications of motor activity were fully appreciated.[3]

Strauss worked with the mentally retarded and the brain injured and noted that brain injury was not confined to a restricted region of the IQ scale. He drew upon his background in Gestalt psychology and believed that the brain-injured child was one who did not "follow the perceptual roles." Great attention was paid to the characteristic distractibility of these children and he had set the pattern for the development of classes for brain-injured children and for children with what were to be called learning disabilities.[4]

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[2] Ibid., p. 11.

[3] McCarthy and McCarthy, Learning Disabilities (Boston: Allyn and Bacon, Inc., April, 1971), p. 27.

[4] Ibid., pp. 29-34, citing Alfred A. Strauss and Laura Lehtinen, Psychopathology and Education of the Brain-Injured Child (New York: Grune and Stratton, 1947), pp. 17, 132.

Kephart saw the problems of the slow learner as perceptual-motor in nature and, consequently, remediation was aimed at those skills. He believed that the muscular response of an organism was fed back into the total perceptual process to adjust the ultimate output, and that the organism must respond for the adequate learning of basic skills to occur. For example, when a person threw a projectile at a target, feedback was involved and if the target was overthrown on the first attempt, muscular exertion was diminished on the second attempt. Thus, perceptual and motor learning proceeded together, the response feeding back to correct the perception. According to Kephart, matters of body image, orientation in space, and discrimination hinged on this explanation.[5]

Kephart accepted the premise that if certain children lacked the basic skills to school learning, the logical approach was to attempt to teach those skills in their natural order of development and that the motor learnings became the foundation upon which intellectual development was built.[6] His views were similar to those of Piaget.

According to Barsch, a curriculum for children with learning disabilities should have only one objective, namely "To correct whatever impediments stand in the way of the

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[5]Ibid., p. 35, citing Newell C. Kephart, The Slow Learner in the Classroom (Columbus, Ohio: Charles E. Merrill Books, Inc., 1960), p. 158.

[6]Ibid., pp. 36-37.

child taking full advantage of the offerings of the regular curriculum."[7] His physiologic curriculum was based on movigenics, which was the study of the origin and development of movement patterns leading to learning efficiency.[8]

Barsch, in discussing the learner and the learner's developing readiness to read, said:

> Details of a child's special world study area must be such that it will trigger his visual perceptual motor skills for success. Then, attention must be given to his general patterns of movements in his spatial world. The learner should have a good orientation of "front," "back," "side," "up," and "down."[9]

Frostig, Getman and Skeffington have published research and materials which have focused primarily on assessment and remediation techniques in the area of visual perception.

Frostig was in agreement with earlier research by Piaget concerned with development of intelligence in children. She stated:

> Perception is the major developmental task of the child between the ages of three and about seven and one-half years of age when the child first enters school and begins to be faced with academic tasks.[10]

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[7] Ibid., p. 37.

[8] Ibid.

[9] C. Wayne Shearer, A Study Comparing Disadvantaged Pre-School Children's Test Scores in Directionality Orientation and Sensory Concepts Fundamental to Their Reading Readiness Before and After Visual-Perceptual Motor Training (Duncan, Okla.: Optometric Extension Program Foundation, Inc., 1970), pp. 10-11, citing Ray H. Barsch, Learning Disorders: Six Factors in Learning (Seattle, Washington: Special Child Publications, 1965), pp. 327-43.

[10] Shearer, ibid., p. 10, citing Marianne Frostig and David Horne, Learning Disorders: An Approach to the

A large number of children who on the "Marianne Frostig Developmental Test of Visual Perception Test" scored low in their visual perceptual development, also had an inability to adjust to both the academic and behavioral demands of school in the early grades. The test was designed to serve as the basis of specific remedial programs. The differentiation of various kinds of visual-perceptual abilities was one of its chief aims.[11]

Getman held that visual perception was learned and was based upon developmental sequences of physiological actions of the child. He believed that it was necessary to have good coordination of the body parts and body systems in order to develop perception of forms and symbols. He used the term "visuomotor complex" and explained that it was chosen to indicate the intricacy and unity of the total visual system. This model was a guideline for mind-body training designed to assist children toward their maximum cognitive growth. A child's reading ability, then, was the ability to recognize representations or symbols that stood for the things, places, and people that made up the world in which he lived. Though Getman's views derived from a consideration of the ocular mechanisms and visual perception,

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Treatment of Children with Learning Disorders (Seattle, Wash.: Special Child Publications, 1965), pp. 293-305.

[11] Ibid., p. 10, citing Frostig and Horne, ibid., pp. 293-305.

his thinking involved considerably wider areas and had points of communality with that of Kephart and, especially, Barsch.[12]

Skeffington initiated a model of vision development which was later to be used by Getman and other optometrists to explain visual performance. From this model developed a program of visuo-motor training. The first performance area was the Anti-Gravity Process, which was the total motor system used for locomotion, exploration, and organizing oneself in the environment. This was a combination of "modes of movement through space." The second performance area was the Centering Process, which was the ability to place oneself and other things in the environment, to have developed feelings of location and orientation. The Identification Process, the third area of performance, was the ability to label things, according to likenesses and differences. The fourth area of performance was the Speech-Auditory Process, which was a communication skill. According to Skeffington, these processes operated at all times and were integrated into the whole.[13]

Delacato's theory and treatment was a neuro-physio-

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[12]Ibid., pp. 9-10, citing G. N. Getman, Learning Disorders: The Visuomotor Complex in the Acquisition of Learning Skills (Seattle, Wash.: Special Child Publications, 1965), pp. 48-65.

[13]McCarthy and McCarthy, op. cit., p. 46; and Robert M. Wold, Visual and Perceptual Aspects for the Achieving and Underachieving Child (Seattle, Wash.: Special Child Publications, Inc., 1969), pp. 48-51, citing A. M. Skeffington, "Postgraduate Papers," in Optometric Extension Program: Papers (Duncan, Okla., 1926-1968).

logical approach and stressed two ideas: "If the problem lies in the nervous system, the nervous system must be treated and . . . ontogenic development recapitulates the phylogenetic process."[14] According to Delacato, the learning of tool subjects depended upon a certain level of neurological organization. If the child had not achieved the prerequisite organization because of slow or faulty development, or trauma, such learning did not occur. He believed that one could succeed in reorganizing the nervous system of such a child by revisiting the operations of childhood in a systematic way. He commented that sensory reception was a prerequisite to motor expression and that a program of sensory stimulation to make the child body-conscious aided development of perceptual motor skills. Delacato recommended cross-pattern creeping to develop sensory-motor stimulation in developing reading abilities.[15]

Fernald believed in using remedial techniques in the basic school subjects. She once remarked:

> All difficulties in individuals of normal or superior intelligence can be removed or compensated for, provided proper techniques can be employed. Emotional disabilities, poor physical adjustments, and difficulties in school subjects can be overcome if proper diagnosis and treatment can be provided.[16]

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[14]McCarthy and McCarthy, op. cit., p. 49.

[15]Ibid., pp. 49-54; and Carl H. Delacato, The Diagnosis and Treatment of Speech and Reading Problems (Springfield, Ill.: Charles C. Thomas, Publisher, 1968), pp. 1-40, cited by Shearer, op. cit., p. 12.

[16]Grace Fernald, Remedial Techniques in Basic School Subjects (New York: McGraw-Hill, 1943), p. 2, cited by McCarthy and McCarthy, op. cit., p. 68.

Fernald's method was a variation of the experience approach in which visual, auditory, kinesthetic, and tactile modes of learning were emphasized. This method has been sometimes referred to as the VAKT or the Visual Motor Approach and has been successful with children of normal and superior intelligence who had a short memory span for verbal material and who had difficulty in associative learning of the visual type. Fernald stressed the importance of the child tracing words with his finger and having contact with the paper.[17]

Belmont and Birch found that the growth of auditory-visual integration was most rapid between the ages of five and seven years, reaching a level at about the age of ten. They noted that this most rapid period of integrative growth in auditory-visual functioning coincided with the ages of most rapid emergence of visual-haptic, visual-kinesthetic and haptic-kinesthetic integrative competence. They implied that the acquisition of haptic-kinesthetic integration may be viewed as learning to read and, in fact, may be a prerequisite for reading. They concluded that in acquiring reading skills, primary perceptual factors were most important for initial acquisition but more general

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[17]J. Louis Cooper, An Adaptation of the Fernald-Keller Approach to Teaching An Initial Reading Vocabulary to Children with Severe Reading Disabilities (Storrs, Conn.: University of Connecticut, Reading-Study Center, 1969), pp. 1-2.

intellectual factors for later elaboration.[18]

De Hirsch suggested that ambiguous laterality was an expression of difficulty with spatial orientation and frequently found in combination with disturbance and formulation of spoken and printed language.[19]

Shearer wrote:

> De Hirsch supports the need for training visual-perceptual awareness prior to the stage of reading readiness and also supports the correlation of the child's ability to integrate inter-sensory information and his resultant reading test scores.[20]

Spache regarded visual perception as one of the highest levels of neuromuscular behavior of which man was capable. He found that skill in visual perception was most significant among individuals reading at primary levels. Spache said that children with inadequate perceptual-motor development exhibited problems of confusion in left-right orientation, in directionality, in form perception and spatial perception and in concepts of body image, thus resulting in disabled readers. He stated that various tests would reveal whether the child's neurological development

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[18]Herbert G. Birch and Lillian Belmont, "Auditory-Visual Integration, Intelligence and Reading Ability in School Children," Perceptual and Motor Skills, XX (April, 1965), 295-305.

[19]Selma G. Sapir, "A Pilot Approach to the Education of First Grade Public School Children with Problems in Bodily Schema, Perceptual-Motor and/or Language Development" (Scarsdale, N.Y.: Columbia University and Union Free School District No. 1, April, 1967), pp. 38-39.

[20]Katrina de Hirsch, "Concepts Related to Normal Reading Processes and Their Application to Reading Pathology," Journal of Genetic Psychology, CII (April, 1963), pp. 227-85,

was sufficiently advanced to support the perceptual-motor skills that enhanced reading and visual perception.[21]

Wepman's studies have shown that perceptual abilities developed significantly in the first three years of school in a normal population along the lines of individual modality preferences. He reiterated that there was a low but consistent relationship of perceptual factors to school achievement, and he suggested further that the early learning of children was a function of modality based on perceptual-motor skills. He recommended that in a given child with slow development or deficits in visual perceptual ability there should be a strong auditory emphasis in his early learning and a separate attempt to develop his more inadequate visual skills.[22]

Gesell and Ilg stressed the interrelation of sensory and motor functions which evolved into a total action system. They stated that human visual perception ranked with speech in complexity and passed through comparable developmental phases. Seeing was integrated with the total action system of the child, which consisted of his posture, his manual skills and coordination, his intelligence, and even his

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cited in Shearer, op. cit., p. 12.

[21]George D. Spache, Reading in the Elementary School (Boston: Allyn and Bacon, Inc., 1964), pp. 32-57; and Shearer, op. cit., p. 14.

[22]Joseph N. Wepman, "School Achievement as Related to Developmental Speech Inadequacy" (Chicago: University of Chicago, Project 2225, Grant No. 4 10 006, June, 1967), cited in Wold, Visual and Perceptual Aspects.

personality makeup. Gesell and Ilg called attention to the cerebral cortex in that it organized visual acts and became the seat of action for the action system. They said that as the child matured and advanced in school, a symbolic cue in the form of a printed word replaced the immediate necessity of manipulatory cues. Gesell stated that in this dynamic process of learning, vision and perception developed and proceeded from gross motor to fine motor patterns.[23]

Ellingson, in discussing dyslexia (a type of reading disability), stated:

> No matter what specific form the reading disability takes for a particular child, the one word which best describes this problem is perception. Visual perception is the key to reading. Visual-motor coordination is the ability to coordinate vision with movements of the body. Visual-motor coordination is important to space perception and planning motor sequences which leads to reading readiness.[24]

Bannatyne and Wichiarajote found that balance required the integration of visual, proprioceptive and muscular information. They stated that the ability to balance on one leg with the eyes open was positively correlated with spelling achievement. They concluded that overall coordinated motor control and eye-motor coordination was nec-

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[23]Arnold Gesell and Francis L. Ilg, Vision: Its Development in Infant and Child (New York: Hafner Publishing Company, Inc., 1967), pp. 30-134, cited in Shearer, op. cit., pp. 12, 14.

[24]Careth Ellingson, The Shadow Children (Chicago: Topaz Books, 1967), pp. 23-29, cited in Shearer, op. cit., p. 8.

essary to good spelling and reading readiness.[25]

Henry described pre-school experiential skills as consisting of visually-controlled general and special action skills of body movement, along with visual-perceptual developmental experience. He said that the skill and accuracy of eye-hand coordination in producing drawn and written symbols, became the foundation to visual interpretations of likenesses and differences in words and numbers printed in workbooks and texts.[26]

In the research studies of Johnson and Myklebust, they discovered that children with learning disabilities often were unable to properly orient themselves in space and to learn to distinguish right from left. Usually the child could not indicate right or left either on his own body or when looking at someone else. In these children they saw an inability to point to body parts when there was also a difficulty understanding verbal concepts.[27]

Peiser, a Doctor of Optometry whose practice was largely devoted to the vision problems of learning disabled

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[25]Alex D. Bannatyne and Penny Wichiarajote, "Relationships Between Written Spelling, Motor Functioning and Sequencing Skills," Journal of Learning Disabilities, II (January, 1969), 6-16, cited in Shearer, op. cit., p. 9.

[26]W. R. Henry, "Differential Observations for Visually Related Classroom Problems," The Optometric Weekly, LIX (December 5, 1968), 35-39, cited in Shearer, op. cit., p. 11.

[27]Doris J. Johnson and Helmer R. Myklebust, Learning Disorders: Dyslexia in Childhood (Seattle, Wash.: Special Child Publications, 1965), pp. 259-92, cited in Shearer, op. cit., p. 12.

children, felt that reading ability was the basis for most academic learning. He stated:

> In beginning reading, a child has to match the appearance of the word in print to its sound, and give the vocal equivalent. For a child's first five years of life, all of his language experience is strictly oral and auditory: there is no reading or writing involved. When he enters first grade, he has to be able to make this intersensory shift from audition to vision. Peiser concluded that the visual skills involved at this stage of learning are visual directional awareness, visual form perception, intersensory integration, and eye-hand coordination.[28]

In an article intended for teachers to promote healthy visual perception development in children, Blankenship stated two factors which she felt were important to visual perception:

> First, an adequate functioning of the eyes and the central nervous system, which is controlled and limited by many factors within the individual; and second, the opportunities for correct learning and for the experiences that form a basis for interpretation of the individual's environment.[29]

She wrote that the brain must function in a connecting way so that each perceptual experience would join to the past, experiences which would become a permanent part of learning for future reference. She felt that in visual perception problem solving, if the child focused on an object or situation where he could make an immediate associa-

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[28]Irving J. Peiser, "Vision and Learning Disabilities," Journal of the American Optometric Association, XLIII (February, 1972), 152-58.

[29]Elsie Blankenship, "A First Primer on Visual Perception," Journal of Learning Disabilities, IV (January, 1971), 40.

tion, opportunities should be given for him to inspect the object for familiar basis associations of size, shape, and weight. This information would assist him in making a more meaningful interpretation of the unfamiliar and he could begin to use this information for later reference.[30]

II. Identification of Visual Perceptual and Reading Problems

The classroom teacher should have available for her use some guidelines for the identification of children with visual perceptual and reading disabilities. Many different terms have been used by authors to describe the same symptom. Clements, in a search for symptoms attributed to children with learning deficits, reviewed over 100 recent publications. The following represents his attempt to classify some of the descriptive elements culled from the literature:

A. Test Performance Indicators
   1. Spotty or patchy intellectual deficits. Achievement low in some areas; high in others.
   2. Below mental age level on drawing tests (man, house, etc.)
   3. Geometric figure drawings poor for age and measured intelligence.
   4. Poor showing on group tests (intelligence and achievement) and daily classroom examinations which require reading.
   5. Characteristic subtest patterns on the Wechsler Intelligence Scale for Children, including "scatter" within both Verbal and Performance Scales; high Verbal-low Performance; low Verbal-high Performance.

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[30] Ibid., pp. 39-42.

B. Impairment of Perception and Concept-formation
   1. Impaired discrimination of size.
   2. Impaired discrimination of right-left and up-down.
   3. Impaired tactile discriminations.
   4. Poor spatial orientation.
   5. Impaired orientation in time.
   6. Distorted concept of body image.
   7. Impaired judgment of distance.
   8. Impaired discrimination of figure-ground.
   9. Impaired discrimination of part-whole.
   10. Frequent perceptual reversals in reading and in writing letters and numbers.
   11. Poor perceptual integration. Child cannot fuse sensory impressions into meaningful entities.

C. Specific Neurologic Indicators
   1. Few, if any, apparent gross abnormalities.
   2. Frequency of mild visual or hearing impairments.
   3. High incidence of left, and mixed laterality and confused perception of laterality.
   4. Hyperkinesis.
   5. Hypokinesis.
   6. General awkwardness.
   7. Poor fine visual-motor coordination.

D. Disorders of Speech and Communication
   1. Impaired discrimination of auditory stimuli
   2. Various categories of aphasis.
   3. Slow language development.
   4. Frequent mild hearing loss.
   5. Frequent mild speech irregularities.

E. Disorders of Motor Function
   1. Rigid movements of hands
   2. Frequent delayed motor milestones.
   3. General clumsiness or awkwardness.
   4. Frequent tics and grimaces.
   5. Poor fine or gross visual-motor coordination.
   6. Hyperactivity.
   7. Hypoactivity.

F. Academic Achievement and Adjustment (Chief Complaints about the Child by his Parents and Teachers)
   1. Reading disabilities.
   2. Arithmetic disabilities.
   3. Spelling disabilities.
   4. Poor printing, writing, or drawing ability.
   5. Variability in performance from day to day or even hour to hour.
   6. Poor ability to organize work.

7. Slowness in finishing work.
8. Frequent confusion about instructions, yet success with verbal tasks.

G. Disorders of Thinking Processes
1. Poor ability for abstract reasoning.
2. Thinking generally concrete.
3. Difficulties in concept-formation.
4. Thinking frequently disorganized.
5. Poor short-term and long-term memory.
6. Thinking sometimes autistic.
7. Frequent thought perseveration.

H. Physical Characteristics
1. Excessive drooling in the young child.
2. Thumb-sucking, nail-biting, head-banging, and teeth-grinding in the young child.
3. Food habits often peculiar.
4. Slow to toilet train.
5. Easy fatigability.

I. Emotional Characteristics
1. Impulsive.
2. Explosive.
3. Poor emotional and impulse control.
4. Low tolerance for frustration.
5. Reckless and uninhibited; impulsive, then remorseful.

J. Sleep Characteristics
1. Body or head rocking before falling into sleep.
2. Irregular sleep patterns in the young child.
3. Excessive movement during sleep.
4. Sleep abnormally light or deep.
5. Resistance to naps and early bedtime, e.g., seems to require less sleep than average child.

K. Relationship Capacities
1. Peer group relationships generally poor.
2. Overexcitable in normal play with other children.
3. Better adjustment when playmates are limited to one or two.
4. Frequently poor judgment in social and interpersonal situations.
5. Socially bold and aggressive.
6. Inappropriate, unselective, and often excessive displays of affection.
7. Easy acceptance of others alternating with withdrawal and shyness.
8. Excessive need to touch, cling, and hold on to others.

L. Variations of Physical Development
   1. Frequent lags in developmental milestones, e.g., motor, language, etc.
   2. Generalized maturational lag during early school years.
   3. Physically immature; or
   4. Physical development normal or advanced for age.

M. Characteristics of Social Behavior
   1. Social competence frequently below average for age and measured intelligence.
   2. Behavior often inappropriate for situation and consequences apparently not foreseen.
   3. Possibly negative and aggressive to authority.
   4. Possibly antisocial behavior.

N. Variations of Personality
   1. Overly gullible and easily led by peers and older youngsters.
   2. Frequent rage reactions and tantrums when crossed.
   3. Very sensitive to others.
   4. Excessive variation in mood and responsiveness from day to day and even hour to hour.
   5. Poor adjustment to environmental changes.
   6. Sweet and even tempered, cooperative and friendly (most commonly the so-called hypokinetic child).

O. Disorders of Attention and Concentration
   1. Short attention span for age.
   2. Overly distractible for age.
   3. Impaired concentration ability.
   4. Motor or verbal perseveration.
   5. Impaired ability to make decisions, particularly from many choices.

Clements stated: "Recognition and acceptance of these specific symptom complexes of learning disabilities, would facilitate classification and the development of appropriate management and education procedures."[31]

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[31]Sam D. Clements, Minimal Brain Dysfunction in Children: Terminology and Identification; Phase one of a Three-Phase Project (Washington, D.C.: Government Printing Office, 1966), pp. 11-13.

To aid teachers in detecting the children who might have vision problems, the American Optometric Association Committee on Visual Problems in Schools has compiled a list of symptoms--a guide to vision problems. This list included symptoms noticed in the appearance of the eyes, behavior indications of possible vision difficulty, and complaints associated with using the eyes.

Observed in Reading:

Dislike for reading and reading subjects.
Skipping or re-reading lines.
Losing place while reading.
Slow reading or word calling.
Desire to use finger or marker as pointer while reading.
Avoiding close work.
Poor sitting posture and position while reading.
Vocalizing during silent reading, noticed by watching lips or throat.
Reversals persisting in grade 2 or beyond.
Inability to remember what has been read.
Complaint of letters and lines "running together" or of words "jumping."
Holding reading closer than normal.
Frowning, excessive blinking, scowling, squinting, or other facial distortions while reading.
Excessive head movements while reading.
Poor perceptual ability such as confusing "o" and "a"; "n" and "m"; etc.

Other Manifestations:

Restlessness, nervousness, irritability or other unaccounted-for behavior.
Writing with face too close to work.
Fatigue or listlessness after close work.
Inattentiveness, temper tantrums or frequent crying.
Complaint of blur when looking up from close work.
Seeing objects double.
Headaches, dizziness or nausea associated with the use of eyes.
Body rigidity while looking at distant objects.
Undue sensitivity to light.
Crossed eyes--turning in or out.
Red-rimmed, crusted or swollen lids.
Frequent sties.
Watering or bloodshot eyes.
Burning or itching of eyes or eyelids.

Tilting head to one side.
Tending to rub eyes.
Closing or covering one eye.
Frequent tripping or stumbling.
Poor hand and eye coordination as manifested in poor baseball playing, catching and batting or similar activities.
Thrusting head forward.
Tension during close work.[32]

Diagnostic testing provided the necessary information so that an individualized remedial program for each child could be prescribed. Not all tests could be administered by the classroom teacher; a psychologist or specialist must administer some specific tests. The School District of Skokie, Illinois has prepared a list of suggested tests for remedial diagnosis, of which some are recorded below.

Test	What Does It Assess?
Intelligence Tests	
Wechsler Intelligence Scale for Children (WISC)	Intelligence (also correlates to disability)
Otis-Lennon Mental Ability Test	Intelligence--group test
Lorge Thorndike Intelligence Test	Intelligence--group test
California Test of Mental Maturity	Intelligence--group test
Science Research Associates' Primary Mental Abilities Test	Intelligence
Academic Achievement Tests	
Stanford Achievement Test	All academic subjects
Metropolitan Achievement Test	All academic subjects

[32]Teachers' Guide to Vision Problems (Duncan, Okla.: Optometric Extension Program Foundation, Inc., 1968).

Wide Range Achievement Test	All academic subjects
<u>Diagnostic Tests</u>	
Subtests of the WISC	Several correlates to learning
Bender-Gestalt	Visual-Motor Coordination
Beery-Buktenica	Visual-Motor Coordination
Detroit Test of Learning Aptitude	Psychological correlates to learning.
Illinois Test of Psycholinguistic Abilities	Psychological correlates to learning and spoken language comprehension
Wepman Test of Auditory Discrimination	Auditory discrimination
Auditory Discrimination Subtest of the Gates-McKillop Reading Diagnostic Test	Auditory discrimination
Auditory Blending: Gates-McKillop Reading Diagnostic Test	Auditory blending
Roswell-Chall Auditory Blending Test	Auditory blending
Frostig Test of Visual Perception	Visual perceptual skills and visual-motor coordination
Graham Kendall Memory for Designs	Visual Memory Non-Verbal
Peabody Picture Vocabulary Test	Spoken language comprehension
Gates-MacGinitie Reading Test	Reading
Gray Oral Reading Test	Reading (Diagnostic)
Roswell-Chall Reading Diagnostic Test	Reading (Diagnostic)

Gates-McKillop Reading Diagnostic Test	Reading (Diagnostic)
Gates-Russell Spelling Test	Spelling
Picture Story Language Test	Written Language Expression (Diagnostic)
Advanced Test of Visual Perception--Getman and Kephart	Visual Perception
Perceptual Survey Rating Scale--Kephart	Visual Perception
Purdue Perceptual-Motor Survey	Visual-Motor
Slingerton Test	Visual Memory
Valett Test	Body Image
Silvaroli Reading Test	Classroom Reading Inventory--Individual
Spache Diagnostic Reading Scales	Reading (Diagnostic) Individual
Durrell Analysis of Reading Difficulty	Non-reader (individual)[33]

III. Methods and Materials Used for Remediation

When planning remediation, the teacher should have been aware of mental and achievement levels, but she also should know how a child learns or does not learn. Without consideration for learning processes, the methods tended to be vague or even inappropriate. Johnson stated:

> One of the most effective means of gathering information about a child's learning is task analysis.

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[33]Anita Jacobson, "Remedial Diagnosis for the Teacher" (Skokie, Ill., District 68, Learning Disabilities Project, 1971), pp. 5-7.

> By analyzing tasks, including the nature of the input, the expected output, and the processes necessary to complete them, a teacher can begin to understand the patterns of success and failure. Furthermore, this will shift the educator's orientation from subject matter of the curriculum to learning processes.[34]

She suggested that the teacher first look at the nature of the input, meaning, did the task involve one modality or two or more modalities? Secondly, it was noted whether the task was verbal or non-verbal. Next it should be noted whether a task was meaningful or nonmeaningful. Another part of the analysis pertained to the level of the task; whether the impairment occurred primarily at the level of perception, memory, symbolization, or conceptualization. Finally, the mode of response was examined which could be of three major types: the first involved recognition, manipulation, gesture or pantomime; the second was oral (spoken) and the third was visual-motor (written).[35]

In teaching the learning disabled child, new approaches and methods had to be found. Usually no one child had disabilities in all learning areas and therefore the instruction needed to be somewhat individualized. Burg offered some excellent suggestions for the teacher working with this type of child in beginning her program. A few of them were listed

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[34]Doris J. Johnson, "Educational Programming for Children with Learning Disabilities" (speech presented for the Association for Children with Learning Disabilities at the White House Conference on Children and Youth, Pittsburgh, Pa., 1970), p. 28.

[35]Ibid., pp. 29-30.

below.

1. Begin where the child is able to have success.
2. Be sure the child understands what he is expected to do. Demonstrate rather than talk.
3. Vary the techniques used and shorten assignments.
4. Use all the senses of the child to help him learn by means of concrete experiences.
5. Use materials that involve fine motor activities such as puzzles, blocks, and peg boards.
6. Keep records of daily work, including anecdotal records.
7. Be firm but supportive.
8. Have the child correct each mistake.
9. Set time limits when each job must be completed.[36]

As previously stated, Kephart believed in motor activities for training children with learning disorders. In one of his books, he devoted a chapter to ocular motor coordination which was learning to use the eyes and hands together as a unit. He stated how important this information was for future academic learning and suggested activities for helping the child develop his visual motor controls. The activities were categorized into fixations, pursuits and convergence. Some activities cited by Kephart that could be used in the classroom to encourage the child to fixate his eyes on his hands as he works are listed below.

1. Exploration of self and a variety of objects.

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[36]Mary Burg, Handbook for Teachers of Children with Specific Learning Disabilities (Ohio: Hamilton County Public Schools, 1969), pp. 35-36.

2. Looking and pointing at pictures, randomly or from one to another in a row of pictures or objects.
3. Pointing out various objects in the room as they are named.
4. Playing with form boards, simple puzzles, and pegboards.
5. Bead stringing and poking at soap bubbles in the air.
6. Placing of knives, forks, and spoons in separate trays.[37]

When a child was insensitive to similarities and differences in pictures, words, letters, and drew and copied drawings poorly, Harris suggested the following:

1. Practice in clay modeling, drawing, cutting around outlines.
2. Assembling picture puzzles.
3. Finding missing parts in pictures.
4. Describing pictures in detail.
5. Exercises for noting visual similarities and differences, such as those in reading readiness workbooks.
6. If very poor, delay reading.
7. Check for possible visual difficulty.[38]

McCarthy and McCarthy, in their book, described some activities used in a visual-perceptual-motor program in a midwestern city. They stated that the materials and methods derived rather directly from the movigenic theory of Barsch. Some of the more typical equipment found in this classroom included a piano, tables and chairs, cupboards, chalkboards and pegboards. Listed were some of the activities that they described.

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[37]Clara M. Chaney and Newell C. Kephart, Motoric Aids to Perceptual Training (Columbus, Ohio: Merrill Publishing Co., 1968), p. 116.

[38]Albert J. Harris, How to Increase Reading Ability (New York: Longmans, Green and Co., 1956), p. 53.

1. Each child was required to walk forward and backwards on a walking rail, keeping his eyes fixed on a target.
2. Patterning exercises were used such as the children lying flat on the floor, slid their left knees from a straight to a bent position and their left arms from a side to a raised position while turning their heads left. Repeat using the right limbs.
3. Rhymes using body exercises in time to a metronome.
4. Reading, reading aloud his own pack of flash cards, and reading from a standard beginning reading series.
5. Individual activities designed to meet their specific needs.
6. Visual training such as in a darkened room, the children used a flashlight to follow the curved pathways of a large pattern drawn on the board.[39]

In Wold's book, a chapter on visual perceptual motor training, written by Harold N. Friedman, suggested techniques which were directed for the classroom. Friedman commented that the perceptual motor areas most often trained were bilaterality, directional orientation, visual memory and form perception. He described a game called 'word-in-word game' which trained the areas of visual memory, form organization, and directional orientation and were directly adaptable to reading and writing. A long word was put on the board and the children were asked to find words within the big word. The letters did not have to be in order. At first the children were allowed to find any words they could in a period of time to become familiar with the task. Gradually it was pointed out that if they organized the task they could find many more words in the same period of time. For example,

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[39]McCarthy and McCarthy, op. cit., pp. 75-79.

they looked for all two-letter words first, then they looked for word families such as "it," "sit," and "pit." After a while the children began to recognize the similarities in word structure, spelling became easier, and the children were having fun while working with words.[40]

Dechant, in his book, offered some excellent suggestions for training in visual discrimination. He suggested using matching exercises in order to help the child gain skill in noting the differences and similarities among words, objects, and signs. Each pupil was presented with a copy of his name and asked to note the differences and similarities between his name and that of some of his classmates. Each pupil was also provided with a mimeographed page of letters and/or monosyllabic words that were arranged in columns by pairs. The children were asked to encircle those pairs that were different. An exercise calling for the same type of skill was to present three words and let the pupil select the word that was repeated more than once in the sentence.[41]

According to Johnson, improvement of children's visual memory was usually accomplished through helping them to place a high value upon the following suggested activities and providing them with meaningful opportunities to make use of them. He suggested that sharing of experiences and relating what one

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[40]Wold, Visual and Perceptual Aspects, p. 404.

[41]Emerald V. Dechant, Improving the Teaching of Reading (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1970), pp. 186-88.

has seen, heard, or experienced were all valuable activities directly related to the daily living experiences of the children. For a game requiring visual memory, a number of objects were placed on a table, the children examined them, and then several were removed. Which ones were removed? Johnson also recommended the Fernald tracing method for re-enforcement, which made use of the principle of emphasizing the task at hand as compared to the surrounding stimuli.[42]

Cohen, in his book, had an excellent chapter on solutions for visual perception, which included exercises for articulation of body schema, working toward a more flexible posture, localization of body parts in space, laterality training, kinesthetic differentiation, laterality training, development of motoric control, directionality training, and form perception. An example of some specific form perception exercises were listed below:

1. Chalk circles, triangles, squares, diamonds on the floor.
2. Children march around them, hop around, jump around outlines.
3. Children draw imaginary triangles, squares, and so on in the air with their noses or with upper torso bent forward, using their heads as pencils.
4. Children trace around wooden templates of different abstract forms. (They should use large, colored chalk and work on rectangular chalkboards laid out on the floor.)
5. Children try copying their forms freehand with chalk.

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[42]G. Orville Johnson, Education for the Slow Learners (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), pp. 132, 305.

6. Children construct the various forms with matchsticks or straws--on a felt board.[43]

A handbook by Valett listed concrete exercises and activities that could be used by the teacher in developing the special program required by the individual needs of a given pupil. Listed under perceptual-motor skills were exercises for visual acuity, visual coordination and pursuit, visual-form discrimination, visual figure-ground differentiation, visual memory, visual-motor memory, visual-motor fine muscle coordination, visual-motor spatial-form manipulation, visual-motor speed of learning, and visual-motor integration. Under visual figure-ground differentiation which was the ability to perceive objects in foreground and background and to separate them meaningfully, he recommended the following program ideas:

1. Reduce stimuli in order to restrict the perceptual environment. Present one activity at a time and break down to component parts for visual differentiation.
2. Doll house for free play and placement.
3. Toy farm: Pupil watches and participates in farm arrangement.
4. Object differentiation: "Point out the doll in front of the house."
5. Form differentiation: "Point out the square things in this room."
6. Tracing: Trace two- and three-dimensional forms with fingers. Trace objects on paper. Use stencils to trace designs. Shade or color both the figure and the background. Copy pictures and designs, and watch others copy and trace and then finger trace their work.

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[43]Alan Cohen, Teach Them All to Read (New York: Random House, Inc., 1969), pp. 101-21.

7. Photograph activity: Finger trace pupils, parents, etc., in foreground and background of pictures.[44]

In a pilot study conducted with first grade children in Scarsdale, New York, the following curriculum for training in visual perception resulted in rapid improvement of deficit children:

> Training in visual perception follows a developmental plan and begins with sensory-motor training. It includes the development of physical skills and suggestions for muscle coordination and eye movements. Exercises with three-dimensional objects precede and accompany the paper and pencil exercises, since concrete manipulation develops visual perceptual skills. The child engages in activities such as shifting and focusing attention, classifying, paying attention to stimuli and following directions. Form perception will follow the program of recognition, matching, copying and recall. Concrete forms are used first, then are superimposed on a stencil sheet and then they are copied. First, one form at a time is used and later two will be combined, and then they are superimposed on each other. Flannel shapes in different sizes and colors and a flannel board are used for teaching discrimination of form. The three-dimensional type materials used are colored cubes, parquetry blocks and peg boards.[45]

The Board of Education in Louisville, Kentucky, has published a curriculum guide for classroom teachers which was intended for the remediation of learning difficulties. Incorporated in this guide were some suggestions for remediation through the visual approach, which the writer would like to mention. In working with part-whole relationships, the following suggestions were offered:

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[44]Robert E. Valett, The Remediation of Learning Disabilities (Calif.: Fearon Publishers-Lear Siegler, Inc., 1967), No. 28.

[45]Sapir, op. cit., pp. C-7, C-8.

> A series of parts in an object is seen rather than the object itself: Show child a toy truck. Does he see the wheels, the bumpers, the steering wheel, and can he think of it as a vehicle or is it a series of parts to him?
>
> Inability to see missing parts in a figure: Cut a large letter from cardboard, removing a portion of it; ask the child to replace the missing part. Cut up simple stories, pasting sentences on tagboard; let child reassemble the story in sequence. Use elementary tachist-o-flasher kit.[46]

In a book written by Smith, sample exercises were described pertaining to noticing likenesses and differences, noticing differences in upper and lower case and between letters, increasing eye span, and developing spatial discrimination.

> For noticing differences in upper and lower case and in letters: The children are to use pipe cleaners for reconstruction of letter forms whether they be in upper or lower case. Beads or buttons may also be used if coordination is developed enough.
>
> For increasing eye span: Use a single column from a newspaper or magazine. Mark two vertical lines through the column. The student is to practice reading the material up to each vertical line in one fixation.
>
> For developing up and down spatial discrimination: The children are to bend up and down on small stairs, and reach up and down.[47]

The Pathway School, which was headed by Getman, used the following methods for the development of movement patterns. Their theory was that the movement patterns assisted the child in learning to use his eyes as the steering mechanism to guide these movements.

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[46]"Learning Difficulties" (Louisville, Ky.: Jefferson County Board of Education, 1969), p. 2.

[47]Carl B. Smith and others, Treating Reading Disabilities: The Specialist's Role (Washington, D.C.: U.S. Office of Education, Bureau of Research, 1969), pp. 54, 56.

> The nine basic general movement patterns are angels in the snow, stomach roll, rolling sit up, regular sit up, bent knee sit up, feet lift, roll from back to hands and knees, roll from back to hands and feet, and toe touch. The visual steering routines are obstacle course, jump board, walking beam, trampoline, rhythmical work with music, all running and throwing games, and swimming.
>
> Some possible ways to achieve the eye-hand relationship skill: Using hammer, lumber and nails--integrates hand movement with visual steering, let child use his preferred hand--two handed skills are just as important as single-handed skills.
>
> Procedures for developing eye movement: Hand things to the child from the side, urge child to look at you when you speak and say things only once, urging him to listen. Use the chalkboard: Bi-Manual Circles (put x on board at child's eye level. Have child use chalk in both hands.) Right hand moves clockwise, while left hand moves counterclockwise. Next, same thing except reverse hands. Then both moving clockwise, both moving counterclockwise. Bi-Manual Straight Lines--both hands moving from outside dot to center at the same time, same thing but reverse direction, then one hand goes from outside to center, while other hand goes from center to outside, then reverse hands. Make every kind of pattern you can think of, have child go over it. Have child speak the directions as he makes the line. Another exercise is to follow the dots.[48]

The Fernald method consisted of four basic stages which she described. The first stage was tracing, in which the child traced a word with his fingers that the teacher had printed or written until he had reproduced it without looking at the copy. Finally, the child wrote the word, saying it by syllables, and then used it in context. The second stage had been achieved when words could be learned without tracing. The child learned a word by saying it, by writing it without copying it as he said each part. The third stage had been reached when the child could write the word after looking at

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[48]Getman, op. cit., p. 54.

the printed form of it and being told what it said. Reading from books began at this stage. During stage four, very little writing of "new" words was necessary. The child understood words by visual analysis.[49]

The writer participated in a visual training workshop sponsored by the New York All-State Optometric Congress. The training session was conducted by Swartwout, an optometrist prominent in the field of visual training. An exercise in cross-pattern walking with flashlights could easily be utilized by the classroom teacher.

> Purpose: To develop visually monitored understanding of body image and laterality in action patterns.
> Apparatus: Two flashlights.
> Method: Have subject walk in a normal cross pattern movement, holding a flashlight in each hand. The flashlights should both be on. Now have him shine the right hand light on his left foot as that foot steps forward, and alternately the left hand light on the right foot as it steps forward. This utilizes the normal cross pattern movement observed in graceful walking. Subject is to watch the forward foot. When walking, pattern is smooth and the lights are accurately placed on each foot, alternately have him name the leading hand or foot in the walking action, while still controlling the flashlights and walking normally.
> Aspects to be Emphasized: Maintains normal cross-pattern walking gait when shining flashlight on his feet. Maintains normal cross pattern walking gait when asked to name the right and left actions of hand or foot.[50]

In a recent article by Frostig, she discussed and illustrated facilitation of transfer of initial visual percep-

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[49]Fernald, op. cit., p. 73.

[50]J. Baxter Swartwout, Ten Visual Training Procedures Emphasizing Visual Awareness, Visual Training Workshop, New York All-State Optometric Congress, Painted Post, N.Y., October, 1970) (Duncan, Okla.: Optometric Extension Program Foundation, 1970), p. 1.

tual training to academic skills. In discussing integration of sensory functions she stated:

> If a child has poor visual perception, he will be helped with reading if he gets auditory feedback, by hearing the words at the same time as he sees them. Materials such as the picture strips from Audio Dynamic Research or the Frostig Program can be used to promote integration of various abilities before the child begins with reading. The picture strips employ sequence of symbols representing a rhythm which the child can sound out through clapping his hands, stamping his feet, or using a musical instrument or his voice, so that auditory perception, visual perception, and language or movement are integrated. Reading series, such as the Oxford Color Readers (Carver and Stowasser, 1963) that match pictures with labels, can be used in a systematic way so that the child sees the picture, sees the word, hears the word, says the word, and then either writes the word or constructs it from the preformed letters. In this way multiple association is established in several sense modalities. Teachers can make similar materials. Other measures are to have the child work with a Language Master and/or listen to recorded audio-tapes. Visual and auditory perception may also be integrated by using a "Hear and Find the Word" game, in which the child must find in a printed list of words the one that is said by the teacher.[51]

Garrison offered some suggestions for activities relating to visual-receptive skills. He recommended the following techniques:

> Work with aids and devices that would lessen the problem for the child. A colorful marker is beneficial to help him keep his eyes focused on the correct target. Use matching and sorting activities, pictures classification, etc. Have the child put together a simple jugsaw puzzle for visual comparison training. For visual projection, training, describe something and have the child name it. Also, have the child tell you, in detail, how to get from his

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[51]Marianne Frostig, "Visual Perception, Integrative Functions and Academic Learning," Journal of Learning Disabilities, V (January, 1972), 1-14.

home to someone else's home.[52]

The "Generalized Behavioral Model" proposed by Osgood has been used as a framework for diagnosis of learning disabilities and for coordination of remedial education. It has served as a basis for the creation of the Illinois Test of Psycholinguistics. A total of twenty-four abilities are generated by the model. An example of an ability follows:

> Function: Visual Decoding-Perceptual
> Description of Function: A variety of perceptual processes from simple to complex are sampled including ocular-motor control, convergence, visual integration, visual discrimination, visual analysis, position in space, and spatial relations.
> Diagnostic Instrument: Fig.-Ground, Frostig and Ayers; Position in Space, Frostig; Spatial Rel., Frostig; Visual Integration, W.I.S.C. Object Assembly, Raven's Prog. Matrices; Visual Analysis, W.I.S.C. Block Design.
> Theoretical Remediation: Frostig, Fairbanks-Robinson, Erie Program, Ruth Cheves, Fitzhugh Program, Continental Press.[53]

The New York State Education Department recommended Peru Central School District as having programs set up for children with learning disabilities. The writer was unable to obtain any statistics as to the progress of the children enrolled in the program because the program was comparatively new, but through correspondence did receive a partial listing of materials and activities that the children engaged in. This school system felt that they had much success with the

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[52]Evangeline L. Garrison, Individualized Reading (Dansville, N.Y.: The Instructor Publications, Inc., 1970), pp. 5-7.

[53]Jerome J. Schiller and Margaret C. Deignan, "An Approach to Diagnosis and Remediation of Learning Disabilities," Journal of Learning Disabilities, II (October, 1969), 19-29.

use of the following materials:

> Our program in the area of vision is designed around the four visual areas of the ITPA--visual reception, visual-motor association, visual closure, and visual sequential memory. Materials used are: Instructo Skills Sheets, Gateway Series, Detect, Michigan Symbol and Word Tracking, 3-D materials, Keystone Stereo Reader, chalkboard exercises, Perceptual Communication Skills Book, Fitzhugh Plus Program, Frostig Program, Vanguard Program, and assorted games and puzzles.
>
> Materials used for Perceptual-Motor Classes: 3-D kits, extensive gymnasium equipment, EDL Controlled Readers, Hoffman Readers, DLM taped programs, and Keystone Stereo Reader.
>
> Materials and methods used for LD Classes: ITPA testing and SEIMC remediation recommendations, many manipulative devices, every commercial program proven to be of help, extra gross motor classes.
>
> LD Teams--Commercial programs were available and applicable, a Catalog of Materials which lists references available in our system for designing programs, Contingency Contracting will be employed when necessary, a system for exchanging programs with other school systems is being devised.[54]

The Instructor Magazine offered many activities, methods and suggestions in solving perceptual problems. The March, 1971 edition discussed reading in rhythm and listed commercial games which could be used for reinforcement of basic reading skills. The December, 1971 edition discussed bringing together mind and body and developing sensory awareness and described numerous activities suitable for the perceptually handicapped child. The November, 1971 edition had a section on new ways to tackle skills and provided activities that could be used in the regular classroom such as a unit on the farm. The August/September, 1969 edition pro-

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[54]From Peter C. Frederick, Peru, New York, October, 1971, courtesy Peru Central School District.

vided information on correcting motor perceptual problems and integrating physical activities and reading readiness. An example of an interesting activity from the December, 1971 edition, follows:

> Hold up an interesting picture for a few seconds. Take it away and have the children describe what the picture was about. Ask pertinent questions to draw out children's memories.
>
> When children are out of the room some day, make several changes and alterations--turn the page on the calendar, reverse pictures in a display, move a chair out of a reading corner, and so on. When they return, let them talk about anything they see out of the ordinary.
>
> Put an object in your interest center which has many observable features--a book, a plant, a tool. Children should know they are expected to observe it carefully. At some unannounced time during the day, remove the object and ask questions about it. If a plant, what was the color? What did its leaves look like? What was its smell? Was it fragile or sturdy?
>
> Put several small objects on a table--different colored blocks, colored beads, small toys, and so on. Everyone hides his eyes while one of the objects is taken away. Pupils try to tell which objects have disappeared.[55]

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[55]"Work/Play Idea Guide," The Instructor, December, 1971, p. 33.

CHAPTER III

A REVIEW OF PREVIOUS STUDIES

Chapter II presented a review of recent literature concerning theories and suggested methods which one would assume would be an aid in the remediation of children with learning disabilities and visual perceptual problems. The basic questions persist: Can these theories and methods that have been developed be used in the regular public school classrooms to prevent future learning problems? Specifically, can training in bodily parts, right-left awareness, tactual, kinesthetic, visual and auditory perception, and language help children mature developmentally and achieve academically, and if so, what are the results? Are our present curriculum techniques adequate or do they, too, need modification? Deficit training for the first year of the educational experience for those children with potential learning disability may make the difference--a lifetime of success or failure.

In recent years a number of studies have been conducted which have some application to this study. The references cited in this section represented a few of the more recent findings which have a bearing upon this investigation and hopefully would answer some of the above questions.

This review is presented under the following major

headings: Studies Involving School Systems, and Studies from Literature Pertinent to School Systems.

I. Studies Involving School Systems

In the Fayette County Public Schools, Lexington, Kentucky, transition groups were formed at grade levels 2, 3, and 5, made up of children with intellectual capacities within the normal range, but whose reading age was at least eighteen months to two years below their instructional level as indicated by chronological age. It was found that these children had behavioral problems ranging from mild to severe, such as letter reversals, gross motor deficiencies, hyperactivity, figure-ground disturbance, left-right progression, etc. With the understanding that these children were not so abnormal that they needed to be separated from their peer group, an attempt was made to adapt the regular curriculum within the school to meet the needs of these youngsters. A three-phase program was developed into which these children were scheduled in addition to their regular classroom activities. The first phase was a highly structured language arts program which provided for experiences for the utilization of senses other than visual and auditory senses from which these youngsters could not learn previously. The children in the transition groups were assigned on the basis of chronological age. Within each group of sixteen, there was a wide range of reading ages. The children remained in heterogeneous homerooms until the end of the administrative period and

at that time the children throughout the school regrouped for language arts block. The reading problem children went to the teacher assigned to their "transition" groups for an hour block of language arts instruction. This caused no stigma to be attached as all students were moving to an instructional area at the same time. At the end of the language arts period general movement throughout the building was again normal, and without undue attention these youngsters moved again as a group to the teacher assigned to them for the arithmetic block. Here again the teacher had a small group with common needs and could employ tactation, kinesthesis and more concrete methods in arithmetic presentations. When these transition groups moved on to science and social studies areas, the teachers were ready for them. Meeting their needs in these areas of instruction indicated stressing the use of lecture, audio-visual aids, charts and experiments rather than reliance upon the textbook which these youngsters could not read.[1]

This method of grouping had accomplished two things: (1) The behavior problems had been removed from the regular groupings, making the teacher-learning situations more satisfactory, and (2) the problem students had been placed in settings in which they could succeed. For many of these youngsters it was the first successful academic experience of their

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[1]Natalie E. Patterson, "Multi-Sensory Approach to Reading Disabilities" (Lexington, Ky.: Fayette County Public Schools, 1968), pp. 3-5.

school lives.[2]

Phase two, motor dysfunction and perceptual problems, were dealt with by the aid of parents and the physical education instructor each afternoon for twenty-five-minute periods. Phase three was dealt with by the music teacher and consisted of "Rhythms and Patterning" for fifteen minutes each afternoon.[3]

In the first eighteen months of the program, increases in reading ages ranged from .8 to 3.4 and averaged 1.7. This improvement was consistent in other areas of instruction also.

The importance of this experiment with curriculum lies in the fact that a successful attempt was made to alter the curriculum instead of the child and that this was accomplished without the employment of additional staff or area specialists. In-service training within the school staff was necessary.[5]

More recently, awareness of the need for preventive and enhancement activities in the early school years has been recognized. This study and report of the Marion Hill School in Pennsylvania, was a result of that awareness. The purpose of the study was to determine the effect of (1) the use of developmental preventive "learning lenses," (2) visual-motor activities in the classroom on the achievement of children who were reading below their expected level or at a slower

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[2] Ibid., p. 5.

[3] Ibid., p. 6.

[4] Ibid.

[5] Ibid., p. 7.

rate of progress, and (3) the effect of both, i.e., learning lenses and visual-motor activities.[6]

The activities prescribed and used in the educational visual training included activities to improve awareness of body scheme, balance (visually steered and visually directed), eye-hand coordination, form perception and form reproduction, eye movement control (pursuits, saccadics), visual spatial relationships, listening and saying skills, and visualization abilities. The activities employed such equipment as a walking rail, a balance board, chalkboard, etc. In addition, the children crawled, crept, hopped, jumped, etc. When skills of eye movements, eye-hand coordination and visual space perception were mastered and when stabilized by "learning lenses" for near-point tasks, there was usually demonstrated an improvement in academic performance, particularly in reading, writing, often in spelling and in concepts of the spatial relationships of numbers (arithmetic).[7]

Group I	17	Visual-motor training and learning lenses only
Group II	10	Visual-motor training and remedial reading
Group III	9	Remedial reading only
Total	36	

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[6]Lula Mae Young and others, Motor Coordination-Visual Perception Study, New Brighton Area School District, Marion Hill School, New Brighton, Pennsylvania, 1966-1969 (Duncan, Okla.: Optometric Extension Program Foundation Inc., 1970), p. 1.

[7]Ibid., pp. 1-2.

Group IIIA	74	Remedial reading only
Total	110[8]	

The 110 children were from average homes and were in Grades 1-6. Their academic performance was usually below their measured capacity. Group I would miss three periods a week of classroom instruction and receive no other remedial help other than the regular classroom instruction; they would receive motor coordination and visual perception training. Group II would receive perceptual training two days a week for twenty-minute periods and remedial reading two days a week for twenty-five minute periods. Group III, the control group, were to receive remedial reading instruction during three forty-five minute periods. Group IIIA made up an additional control group in other schools. Groups I, II and III were those with the lowest achievement and/or ability level in the Marion Hill School. The seventy-four pupils, of similar achievement and abilities, were given the same program of remedial reading instruction at two other schools in the district as that received by Group III.[9]

The conclusions reached were that nearly all pupils gained in the (1) remedial reading program (Group III); (2) training and remedial reading program (Group II); and (3) visual-motor coordination and learning lenses only program (Group I). A greater percentage made highest gains in the training and lenses program only (Group I) and in the

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[8]Ibid., p. 2.

[9]Ibid., pp. 1, 2.

remedial reading program only (Group III) as opposed to the gains made in the reading and training group (Group II). However, the reverse was true in terms of moderate gains. The training and remedial reading group (Group II) gained more.[10] The Supervisor of Reading recommended:

> The "multi-media" approach remedial reading program, with a continued emphasis on visual perception and motor coordination, be extended to all schools in the district. Further, that a preventive program in kindergarten and first grade, in the development of visual perception and motor coordination, should begin in September.[11]

In a similar study by Shearer, it was his desire to determine if visual-perceptual-motor training given to a group of Head Start school children would improve their reading readiness as measured by the Preschool Inventory Test before and after the training of the experimental group in the areas of left-right orientation and of sensory concepts. A further major purpose of the study was to aid in building a curriculum to meet the needs of the children tested in the Hamilton County, Tennessee Head Start Program.[12]

Two selected sample groups of forty in the experimental group and forty in the control group from the pre-school Head Start children tested were identified. A survey of the Preschool Inventory Test directionality section score of each

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[10] Ibid., p. 4.

[11] Ibid.

[12] C. Wayne Shearer, A Study Comparing Disadvantaged Pre-School Children's Test Scores in Directionality Orientation and Sensory Concepts Fundamental to Their Reading Readiness Before and After Visual-Perceptual Motor Training (Duncan, Okla.: Optometric Extension Program Foundation, Inc., 1970), p. 5.

selected child was made. A survey of the Peabody Picture Vocabulary Test score of each selected child was made.[13]

Both individual and group instruction was given to the children in the experimental group, with individual instruction used primarily in daily training sessions of about five minutes for each four-year-old and about six to eight minutes for each five-year-old. The teaching program consisted of five parts: practice in general coordination, practice in balance, practice in eye-hand coordination at the chalkboard, practice in eye movement, and practice in form perception.[14]

The difference in the change comparing the October and May testings between the two groups was significant at the .05 level, the difference being attributable to training.[15]

In a pilot study research design sponsored by the Bureau of Research, U.S. Office of Education, Washington, D.C., fifty-four kindergarten children were screened and matched as closely as possible by score on the Sapir Developmental Scale, chronological age, and sex. Class No. 1 of first grade children consisted of an experimental group of twelve "deficit" children with developmental problems who received a special curriculum. Class No. 2 was the control group and consisted of six "deficit" children with developmental problems and twelve "normal" children without developmental problems. This group received traditional curriculum techniques.

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[13] Ibid., p. 16.

[14] Ibid., pp. 16-17.

[15] Ibid., p. 22.

Class No. 3 was an experimental group consisting of twenty-four "normal" children without developmental problems and receiving traditional curriculum techniques. All of the children were of average or better I.Q. on the Stanford-Binet Vocabulary Subtest.[16]

Class No. 1 received a curriculum emphasizing training in bodily schema, perceptual-motor skills and language. Reading and arithmetic were integral parts of the curriculum, but used a "structural" approach to the content and stressed the philosophy that for these children, emphasis should be placed on the "discrete" unit, building bit by bit to the whole concept. The theoretical emphasis underlying the curriculum was one which believed that children needed organizational and integrative training. Rather than isolation or a diminuation of stimulation, the sensory stimuli must be presented in such a way as to help the child efficiently organize and integrate the input. All three classes were tested in the fall and spring of the first year with a psychodiagnostic battery of tests.[17]

The results clearly favored the experimental group with the deficit children and the major and dramatic differences were in the following areas: language development,

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[16]Selma G. Sapir, "A Pilot Approach to the Education of First Grade Public School Children with Problems in Bodily Schema, Perceptual-Motor and/or Language Development" (Scarsdale, N.Y.: Columbia University and Union Free School District No. 1, April, 1967), p. 10.

[17]Ibid., p. 41.

with special emphasis on expressive language and concepts; the perceptual-motor function, with important changes in the visual perceptual function; the auditory-visual integration and the organizational patterns of perceptual-motor development as evidenced by the change in the Bender-Gestalt patterns; the intellectual function with significant statistical changes upward in the WISC I.Q. score.[18]

Rutherford reported one of the earlier intensive investigations of training effects upon perceptual-motor and related skills evaluated by the Metropolitan Readiness Tests given to kindergarten children following completion of a training program administered to an experimental group of subjects. The training procedures included monocular and binocular ball throw, creeping, and the use of such devices as a walking rail, balance board, Marsden Ball, obstacle course, tether ball, and other techniques. Ten minutes of training were arranged in conjunction with twenty minutes of free play with playground equipment, while a control group of subjects was allowed thirty minutes of free play. The children in both groups totalled seventy-six, ranging in age from five years to just over six years. Comparison of the two groups showed significant differences (at the .01 probability level) for reading readiness according to the Metropolitan Tests; the experimental group was also insignificantly superior in

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[18] Ibid., p. 42.

number readiness.[19]

The Goodenough Draw-A-Man Test was administered to a kindergarten class in the work of Painter, and twenty children with a normal intelligence range were selected from among those children with the lower 50 per cent of the Goodenough scores in the class. Training in three half-hour sessions per week for seven weeks was administered to an experimental group matched with an equal number of subjects in a control group on the basis of I.Q., age, and sex distribution. Procedures in training were planned in reference to writings of Barsch and Kephart. The training encompassed gross motor and body balance activities, specific body image training involving awareness of body parts, angels-in-the-snow, motor responses to visual and auditory stimuli including rhythm, and tactual perception.[20]

> The pre-training/post-training gains demonstrated by the experimental subjects were significantly greater than those shown by the control subjects on the Goodenough Draw-A-Man Test, two subtests of the Illinois Test of Psycholinguistic Abilities, and the Beery Geometric Form Reproduction Test (apparently a forerunner of the Beery-Buktenica Devel-

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[19]William L. Rutherford, "The Effects of a Perceptual-Motor Training Program on the Performance of Kindergarten Pupils on Metropolitan Reading Readiness Test" (unpublished Doctoral Dissertation, North Texas State University, 1964), cited in Steven B. Greenspan, Research Studies of Visual and Perceptual-Motor Training, Continuing Education Courses, XLIV (January, 1972) (Duncan, Okla.: Optometric Extension Program Foundation, Inc., 1972), p. 19.

[20]Genevieve Painter, "The Effect of a Rhythmic and Sensory Motor Activity Program on Perceptual Motor Spatial Abilities of Kindergarten Children," Exceptional Children, XXXIII (October, 1966), 113-16, cited in Greenspan, ibid., p. 20.

opmental Test of Visual-Motor Integration).[21]

In Winter Haven, Florida, it has been demonstrated how potential "low achievers" in the first grade can be identified by predictive tests and how rhythmic training--especially work with geometric forms--can be used as a preparation for formal learning in reading, arithmetic, spelling and other communicative skills. This project was originated nearly nine years ago with the Lions Club, in cooperation with the public schools of Polk County, Florida.[22]

"Visual perception" was enhanced through the drawing of basic geometric forms and the translating of these forms into pictures and symbols. The data indicated that children in the experimental first grades had made considerably more progress (as compared with the achievement of children in control rooms using the traditional curriculum) in paragraph meaning, arithmetic computation, and spelling. They felt that when they organized a sequence of elementary form experiences, such as drawing basic geometric forms first with templates at both chalkboard and desk, then freehand, then carried these forms into meaningful picture forms, and then on into symbolic forms, they got even better results than those obtained in previous studies. This was especially true when these activities were related to certain rhythmic

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[21] Ibid.

[22] Arthur Rice, "Rhythmic Training and Body Balancing," reprinted from The Nation's Schools, February, 1962 (Chicago: The Modern Hospital Publishing Company, Inc., 1962), p. 2.

training, and to body balancing, coordination and other physical and postural training activities. Their tests were showing that when they provided these combined activities before children entered more formal reading, writing and arithmetic instruction, their perception and handling of communicative forms were tremendously enhanced, as much as the equivalent of six months to a year of increased maturity or readiness over the control group.[23]

They felt that experience with forms facilitated reading and that this was accomplished in a three-step process. The first step emerged from the increased ability to recognize form contours and difference, which was fundamental to reading. The second step was a transition, deliberately provided, in which children were encouraged (after mastering basic forms) to use those forms to construct meaningful forms, such as pictures. The third step consisted of leading the children to see that arbitrary symbols and pictures could be used to represent concrete experiences and relationships, thereby simplifying communication.[24]

Children in control rooms were matched with a statistical "twin" in experimental rooms in readiness, socio-economic status, abilities, age, sex and for a number of other characteristics. This last school year, pupils in the lowest socio-economic status received zero scores at the beginning

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[23] Ibid., pp. 3-4.

[24] Ibid., p. 7.

of the school year on the Metropolitan Readiness Test, even though their inherent abilities may have varied. After eight months of experimental activities, the Stanford Achievement Test was used to evaluate gains both in the control rooms and the experimental rooms. In "paragraph meaning" the control group reached a mean grade equivalent score of 1.2. The experimental room had a mean equivalent score of 1.8 (showing six months' difference of educational gain between the mean achievement of the experimental group over the mean of the control group.)[25]

This Winter Haven experiment demonstrated the real meaning of "teaching the whole child," and "we learn by doing."[26]

Speaking for himself and for the Polk County Board of Public Instruction, Superintendent Shelly Boone told The Nation's Schools:

> This country looks on the Winter Haven experiment as an opportunity to work with a dedicated lay group with the possibility of improving our teaching techniques and methods for primary children.
>
> Because of the wide variation in the ages and the physical and mental development of individual children, we believe that we are obligated to find each child's level of development and gear our program to that level.[27]

In another study by Rohr, a school psychologist, 120 pupils from six to eight years of age received visual training with a special teacher for one year. In the second year,

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[25] Ibid.

[26] Ibid., p. 2.

[27] Ibid., p. 11.

fifty-four children from the first grade received training within the classroom. Some of the criteria for the selection of these children were mental age fifteen months or more below chronological age, reading level one year or more below grade level, poor attention span, and test scores indicating a lag in visual-perceptual development.[28]

In the first year, pupils were trained for ten weeks, for two half-hour periods per week. In the second year, effort was made to adapt the program in the classroom.[29]

A balance board and walking beam were used, Frostig's materials, skill games, exercises for muscular coordination, eye-hand coordination, space relations, and also books on perception were added to the professional library.[30]

The wide range reading achievement level was used as an objective measure of "before and after training" reading performance. After each child completed the training program, he was retested with the same tests he was given in order to qualify for training. The differences in his scores were used as an indication of progress. All results showed measured growth during the training period to be above the expected growth. Improvement in academic work as well as increased attention span was reported by teachers for about 80

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[28]Alice M. Rohr, A Multi-District Use of Visual Training as an Instructional Approach in Elementary Education, Draper, Berne-Knox and Schoharie Schools, Schenectady, N.Y., July, 1968 (Duncan, Okla: Optometric Extension Program Foundation, Inc., 1969), p. 6.

[29]Ibid.

[30]Ibid.

per cent of the pupils in training. Objective scoring as well as staff comments suggested that perceptual training was an asset to the progress of many elementary pupils. In March, 1968, 100 pupils who had been trained the previous year, but not in the current year, were re-tested for retention of skills learned. No regression of skills was noted, indicating a lasting effect of training.[31]

The feeling of the people involved in this study was that with the eventual refinement of educational visual training programs, the role of the school in treating the underachieving child will become vastly more effective.[32]

The purpose of a study by Morgan was to show that the use of specific exercises to achieve muscle balance, coordination, visual tracking skills, and so forth, with low achievershhaving visual deficiencies not needing surgical repair would show a significant correlation with later increased scholastic achievement. Also, that after isolation of visual problems, it would be possible to give specific care and practice through exercises of various kinds to increase competence in certain aspects of visual perception.[33]

Eighty third- and fourth-grade low achievers also affected by some visual anomaly, were split into a control group

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[31]Ibid., pp. 6, 9-12. [32]Ibid., p. 3.

[33]Mavis Welch Morgan, The Effect of Visual Perceptual Training Upon Subsequent Scholastic Progress of Children with Specific Visual Disabilities (Orinda, Calif.: Orinda School District, 1966), p. 3.

and an experimental group. The control group was not given any correction of these visual anomalies.[34]

A selection of ten traits was made and used as a criterion for changes in behavior resulting from visual therapy. The traits selected were: (1) headaches; (2) likes self; (3) increased reading comprehension; (4) socially aggressive; (5) improved speech patterns; (6) visual sequence of five digits; (7) misperception of rotated letters; (8) hand-eye coordination; (9) increased sports participation; (10) increased scholastic performance.[35]

The experimental group excelled in all of the tested areas over the control group after training. A recommendation was a plea for early and adequate screening techniques necessary to identify those children who might develop school failure or frustration due to visual factors. Perhaps there was need for development of methods for appraising the child's developmental status and deciding classroom and other needs to increase hi[illegible] learning level. The experimental use of some elementary form-training materials which may give promise of contributing to the child's learning in reading and other organized form perception skills may be advised.[36]

In an eight-month program for remediation of learning disabilities directed by Ferinden, Van Handel, and Kovalinsky, eleven children, ranging in age from seven to eleven

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[34]Ibid., p. 16.

[35]Ibid., pp. 16-17.

[36]Ibid., p. 22.

years, remained in the regular educational program while receiving supplemental instruction in academics and perception. The subjects were administered the following basic test battery: WISC, WRAT, Gates-MacGinitie Reading Tests, Bender-Gestalt Visual Motor Test, Minnesota Percepto-Diagnostic Test, and the ITPA. The program was concerned with the following specific deficits in behavior often found in children with a learning disability: visual and auditory perception, perceptual speed, phonics skills, visual and auditory discrimination, visual and auditory memory span, eye and hand coordination, body image, and visual-auditory association.[37]

> In general, all school personnel associated with these eleven children were quite satisfied with the social and academic progress made; the children were all promoted to the next grade. There were significant gains produced in arithmetic and perceptual performance. The very nature of the perceptual training, such as programmed exercises, seemed to lead to growth in arithmetic computation. The children made fewer mistakes due to carelessness, the number of reversals decreased, greater attention was paid to directional symbols, and the children were able to handle equations and columnar problems with equal facility.[38]

Although significant gains were not produced in reading after an eight-month period of exposure to the learning disability program, significant growth was achieved by the subjects after twenty months.[39]

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[37]William E. Ferinden, Jr., Donald Van Handel, and Thomas Kovalinsky, "A Supplemental Instruction Program for Children with Learning Disabilities," Journal of Learning Disabilities, IV (April, 1971), 17-19.

[38]Ibid., p. 26.

[39]Ibid.

> This delayed reaction may be attributed to the fact that reading is a far more complex process than arithmetic computation; it is less susceptible to concretistic approaches; and it has been intrinsically involved in the student's prior and present scholastic frustrations.[40]

Improvement for all of the subjects was especially noteworthy in their ability to understand themselves, to understand auditory stimuli, and to interpret and understand what they saw, according to results obtained from using the ITPA.[41]

II. Studies from Literature Pertinent to School Systems

Dr. Robert S. Sloat, an educator, made some interesting remarks in a speech presented before the Broward County Optometric Association:

> Besides providing educators with some viable alternatives in understanding why children are having learning problems, developmental optometry has suggested a number of vehicles through which we may help children with learning problems. Permit me to mention another contribution in the field which I have been studying, and that is the results and implications of optometric developmental visual training.
>
> I recently retested three children who had completed such a program. In post-testing the first child showed a decrease in auditory IQ of three points, but an increase of seventeen points in the visual IQ areas. The second child, whose parents did not work with him at home, showed an increase of just six points in visual IQ. The third child started the program with an auditory IQ of 132, a visual IQ of 114, with an overall IQ of 126. This above-average child was demonstrating many of the classic signs of the learning disabled child--including poor motor functioning, reversal of letters,

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[40] Ibid.

[41] Ibid.

> visual-motor and spatial inconsistencies, and she also could not ride a bicycle. On retest, toward the end of the program, an increase of four auditory and eleven visual IQ points was found with an over-all increase of eight IQ points. The program emphasized the development of closure abilities and visual-motor spatial relations. In viewing the specific subtest scores in these areas an increase of twenty-eight points was found in the spatial area and one of forty-two points in the closure area. She now rides a bicycle as well.[42]

In closing, he pointed out that the two major programs in visual perception used in Florida schools today were those developed by Marianne Frostig and the Winter Haven Lions Club of Winter Haven, Florida. These programs, one created by an educator with expertise in the field of vision, and the other created basically by optometrists, were designed to assist the child in developing visual perceptual skills. Dr. Sloat felt that sooner or later optometrists, as well as other specialists who have adapted their skills, will be working in, and with, all phases of public education and private education throughout the United States, as we should not function as isolated entities on the grounds of our so-called expertise.[43]

Presented here are the results of an experiment by Bruininks, which assessed whether the use of teaching approaches consistent with the auditory or visual perceptual strengths of boys considered economically disadvantaged

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[42]Robert S. Sloat, "Optometry: What Is It Worth to Education?" The Optometric Weekly, LXII (September 23, 1971), 39-40.

[43]Ibid., p. 40.

would facilitate their ability to learn and retain a list of unknown words. The sample of 105 subjects included one group of twenty boys demonstrating visual strengths and auditory weaknesses and another group of twenty boys with the opposite perceptual pattern as identified by a comprehensive battery of tests. The subjects had a mean Stanford-Binet IQ of 90 and a mean chronological age of eight years, seven months. Subjects were taught to recognize fifteen words by a visual or sight-word approach, and another set of fifteen words by an auditory or phonic teaching method. Results failed to support the predicted interaction between perceptual attitudes and teaching methods. Findings revealed, however, a trend toward more efficient learning under the visual teaching method. Results were related to other recent studies suggesting that disadvantaged children may learn more efficiently from a visual presentation of verbal material than from an auditory teaching method.[44]

Bruininks stated:

> From a consideration of research on perception and reading, it would seem efficacious to group children for early reading instruction according to their perceptual aptitudes. If a student is deficient in visual perception and memory skills, for example, the teacher might use either instructional techniques which stimulate this deficit, or ignore it by building upon auditory perceptual strengths.[45]

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[44]Robert H. Bruininks, "Teaching Word Recognition to Disadvantaged Boys," Journal of Learning Disabilities, III (January, 1970), 30-38.

[45]Ibid., pp. 30-31.

Superior performance under the visual teaching approach was particularly noteworthy, in light of the fact that the subjects had been exposed to systematic training in phonics during the first and second grades. Bruininks concluded that excessive background noise of many lower class homes undoubtedly encouraged an orientation toward developing structure and order through concentration upon visual experiences.[46]

In an article by Irving J. Peiser, a study performed by Durrell was cited to show the value of perceptual-motor training on school achievement.[47]

> Durrell divided 540 first grade pupils into four homogeneous groups. Each group was given ten minutes of daily training for four months as follows: Group I, auditory training; Group II, visual; Group III, auditory and visual; Group IV, no training (control group). When the groups were evaluated at the end of four months, their reading scores were: Group I, 75.7 percent; Group II, 85.0 per cent; Group III, 93.4 per cent; Group IV, 59.4 per cent.[48]

Friedman, an optometrist, believed that:

> The faulty reading pattern of apparently able and normal children stems primarily from the severe visual pain such children experience at the moments they attempt to fuse words into clear focus so that, as they repeatedly break focus to find relief of the visual pain, they see words in enough jumble and blur to make it difficult for them to read or learn

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[46] Ibid., p. 35.

[47] Irving J. Peiser, "Vision and Learning Disabilities," The Journal of the American Optometric Association, XLIII (February, 1972), 158, citing Donald D. Durrell and Helen A. Murphy, "The Auditory Discrimination Factor in Reading Readiness and Reading Disability," Education (May, 1953).

[48] Peiser, Ibid., p. 158.

> to read with any kind of meaning or skill.
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> Many such able yet poor achieving children also experience marked visual pain at the moments they fuse spatial objects and, as they repeatedly break fusion to find relief of their visual pain, they see the spatial world waver and swim out of focus so consistently they cannot move through space nor can they play at games and sports with any kind of pleasure, skill or abandon.[49]

An evaluation of the changes before, during, and after training of the various aspects of visual behavior, the reading performance, hyperactivity and bodily motor skills of twenty children who attended visual training classes during the school year 1970-71, were gathered from the visual examination, which included a study of visual fusional fixation skills, parents' observation, children's comments, teachers' reports, school grades and their own observations.[50]

All except one of the twenty children who were seriously retarded reading problems, advanced to grade level after they acquired fusional ease through fixation training. These same children began to play at games and sports with fine skill and abandon. These twenty children, who appeared to represent the great majority of seriously impaired readers in our schools, were referred primarily as reading problems, not as visual problems. The visual examination of these children, whether in a professional office or school screening program, did not indicate that they might have had visual

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[49]Nathan Friedman, "Specific Visual Fixation Stress and Motor-Learning Difficulty--Part II," Journal of the American Optometric Association, XLIII (February, 1972), 166.

[50]Ibid., p. 168.

difficulty which could interfere with their reading.[51]

Relationships between visual sequential memory and reading in eighty-one normal and forty-three disabled readers were investigated by Guthrie and Goldberg. The children had normal intelligence and a mean reading grade of 2.5 The mean chronological age of the normals was 8.5 years and the mean of the disabled was 10.3. Partial correlations between three tests of visual sequential memory and three tests of reading were computed. Significant, positive associations were identified between visual sequential memory and paragraph comprehension, oral reading and word recognition.[52] "The results suggested that reading disability may derive from the lack of coordination among three different visual memory functions which are required for reading."[53]

Guthrie and Goldberg concluded:

> A logical analysis of the reading process suggests that visual sequential memory is necessary for the successful comprehension of sentences which are presented in written form. First, visual sequential memory is vital to word recognition. For example, recognition of the word "dog" depends on the memory of all of the letters in the correct sequence. Second, the comprehension of phrases is dependent on visual sequential memory. Whenaa phrase such as "light green butterflies" appears in writing, the reader must recall the correct order of the words to prevent confusion with other possible arrangements of the words such as "green butterflies light" which may con-

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[51] Ibid., pp. 172-73.

[52] John T. Guthrie and Herman K. Goldberg, "Visual Sequential Memory in Reading Disability," Journal of Learning Disabilities, V (January, 1972), 45.

[53] Ibid.

> vey an entirely different meaning. Thus, it is apparent that visual sequential memory refers to the retention of the order of a series of visually presented stimuli, and it is probable that this ability is relevant to reading.[54]

Other necessary capabilities required for reading included visual perception, visual discrimination and visual fusion. They stated that if an individual was unable to determine whether the stimulus was present or absent in the visual field, he would not be able to remember the stimulus. If a person could not distinguish whether two different stimuli were actually the same or different, he would not be able to retain in memory either one of the two stimuli.[55]

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[54] Ibid.

[55] Ibid., pp. 48-49.

CHAPTER IV

A SUMMARY OF THEORIES AND METHODS, A SUGGESTED READING SUPPLEMENT, AND OTHER FACTORS TO TAKE INTO CONSIDERATION IN REMEDIATING CHILDREN WITH VISUAL PERCEPTUAL AND READING PROBLEMS

I. A Summary of Theories and Methods

The development of the child has been traced by Piaget, Gesell, Getman, Kephart, Barsch, Frostig and others. Of primary interest in Piaget's work was that he concerned himself most with the mechanisms which propelled or fostered the development of intelligence from stage to stage. Much of his work pointed to the conclusion that cognitive growth required that the child be challenged to resolve experienced contradictions and conflicts.[1] The notion that a variety of experiences were essential elements of cognitive growth was questioned by Strauss and Lehtinen as they recommended that in classrooms for the perceptually handicapped, stimulation should be reduced to a minimum in order to prevent distraction.[2] Kephart viewed learning disabilities in terms of dif-

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[1] S. Willard Footlik, "Perceptual-Motor Training and Cognitive Achievement: A Survey of the Literature," Journal of Learning Disabilities, III (January, 1970), 44, 46.

[2] Ibid., p. 46.

ficulties in a child's developmental sequence and stated that perception began with coded information from our various sensory receptors. Kephart felt that motor activity was crucial to the elaboration of the intellectual functional structure.[3]

The notion that some form of structured physical activity can contribute to the development of a higher level of learning capacity for these children was also shared by Delacato, who had elaborated a set of exercises derived from his concept of Neurological Organization.[4] Kephart and Delacato were in general agreement as to etiology of disfunction. Kephart's treatment focused upon environmental deprivation and was concerned with the child's orientation to his environment.[5] Delacato included deprivation of environmental stimulation as a subcategory of brain damage.[6] The fact that one school emphasized the Central Nervous System and the other school emphasized the environment had led to confusion of the role of medicine and the role of education. The fact that each school recognized the importance of the whole child in

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[3]C. Wayne Shearer, A Study Comparing Disadvantaged Pre-School Children's Test Scores in Directionality Orientation and Sensory Concepts Fundamental to Their Reading Readiness Before and After Visual-Perceptual Motor Training (Duncan, Okla.: Optometric Extension Program Foundation, Inc., 1970), p. 14.

[4]Footlike, op. cit., p. 42.

[5]John R. Kershner and David H. Bauer, Neuropsychological and Perceptual-Motor Theories of Treatment for Children with Educational Inadequacies (Harrisburg, Pa.: Pennsylvania State Department of Public Instruction, Bureau of Research, September, 1966), p. 4.

[6]Ibid.

relation to his environment indicated that both schools agreed that remediation should be directed to the possible omissions in perceptual and neurological development. A common element in theory and remedial procedures served to link the two together as the premises upon which both theories rest were derived from the physiological basis of perception.[7]

Ellingsen, Johnson and Myklebust stated that motor ability and visual perception were interrelated with reading abilities in children.[8] Spache and Frostig made different research studies which ended with similar findings that children who had severe visual-motor-perceptual handicaps most often had trouble in reading abilities and did not make satisfactory progress in their academic learning in school.[9] Getman said that the ultimate development of a total child was the organization of visual-perceptual skills. His research concluded that visual perception was learned and was based upon developmental sequences of physiological actions of the child.[10]

Strauss and Kephart, Belmont and Birch, and Frostig, all placed great stress on the awareness of self as expressed in the body image and indicated the importance of this awareness on visual perceptions and spatial orientation.[11]

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[7] Ibid., pp. 4-6.

[8] Shearer, loc. cit.

[9] Ibid.

[10] Ibid., p. 15.

[11] Robert S. Arner, A Rationale for Developmental Testing and Training (Duncan, Okla.: Optometric Extension Program, Inc., 1965), p. 3.

When combined in a unified whole, the theories and findings of these studies presented a sequential pattern. Developmentally, behavior appeared to be hierarchically organized relative to different sensory systems. The earliest would seem to be the proprioceptive, then the tactile, then the auditory, and then the visual. Finally, language came to assume its role in behavioral control.[12] Various findings reported that motor ability and visual perception were interrelated with reading abilities in children. The research of the literature discussing this relationship between reading readiness and the development of the visual-perceptual-motor performance consistently revealed that children with learning disabilities have poorly developed basic visual-perceptual-motor skills used in reading.[13] Therefore, the visual mechanism reached its ultimate levels of contribution to the perception of size, form, texture, weight, relative positions, depth, direction and distance as a result of total organismic motor patterns related to these visual experiences.[14]

An important task was to determine a remedial approach for caring for these children based on a rationale of these theories and findings. Presented in Chapter II was a review of literature concerning the methodology for such programs

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[12]Footlik, op. cit., p. 44. [13]Shearer, loc. cit.

[14]"Vision . . . Perception . . . And Learning," (prepared especially for the 1970 White House Conference on Children and Youth by the Optometric Extension Program Foundation, Inc., Duncan, Oklahoma), p. 1.

which had been suggested from different theoretical positions. Some of the suggestions were that bodily and spatial schema was significantly related to later orientation to the environment, by Kephart;[15] the perceptual-motor development of the child was related to academic success, by Birch[16] and Frostig;[17] and that differential diagnosis was possible and specific learning techniques could be developed to alleviate the deficits, by Frostig.[18] Other approaches were the visual-perceptual approach emphasized by Strauss;[19] a movement approach by Barsch;[20] and the application of tactual techniques, by Fernald.[21]

Since most of the writers (Delacato, Frostig, Gesell,

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[15]Newell C. Kephart, The Slow Learner in the Classroom (Columbus, Ohio: Charles E. Merril Books, Inc., 1960).

[16]Herbert G. Birch and Lillian Belmost, "Auditory-Visual Integration, Intelligence and Reading Ability in School Children," Perceptual and Motor Skills, XX (April, 1965), 295-305.

[17]Marianne Frostig and David Horne, Learning Disorders: An Approach to the Treatment of Children with Learning Disorders (Seattle, Wash.: Special Child Publications, 1965).

[18]Ibid.

[19]Alfred A. Strauss and Laura Lehtinen, Psychopathology and Education of the Brain-Injured Child (New York: Grune and Stratton, 1947).

[20]Ray H. Barsch, Learning Disorders: Six Factors in Learning (Seattle, Wash.: Special Child Publications, 1965).

[21]Grace M. Fernald, Remedial Techniques in Basic School Subjects (New York: McGraw-Hill Book Co., Inc., 1943).

Ilg, Getman, Kephart, Piaget, Skeffington, Strauss and Lehtinen) agreed that adequate "normal" neurological organization was a result of stimulation and activity experienced by the growing child in some ordered, developmental sequence, the Reading Research Foundation believed that it would follow that supplying the stimulation and activity in the appropriate sequence was one of the major factors in the efficacy of a remedial program.[22] The rationale of these writers suggested:

> The approach to caring for children is a developmental approach--that is, that all behavior (including skills and abilities, motor performance, perceptual processes, cognitive functions, and personality) develops, and is generalized, elaborated, and refined as the structures of the body mature and experiences are acquired. Learning as well as structural and physiological maturation play an important role in this development.[23]

Keeping the rationale of these writers in mind, it would seem that learning programs could be planned for the visual-perceptual handicapped children. Several centers throughout the country have conducted such research and have found in many pilot settings, that perceptual training aided the pupil's general body movement and could enhance his academic success. Some of these centers were the Gesell Institute in Connecticut, the reading laboratory and clinic at the University of Florida in Gainesville, headed by Dr. George D. Spache, the Marion Hill School in New Brighton, Pennsylvania,

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[22]Footlik, op. cit., p. 44.

[23]James F. Koettig, "Vision Development Guidance," The Optometric Weekly, XLII (July 15, 1971), 30.

and the Winter Haven Lions Club project in Florida. The results and findings of some of these studies and others have been summarized in Chapter III. They all had a similar clinical rationale embracing a developmental approach.

Because, at this time, there were no final answers to the problems of these children, owing in part to the wide diversity of symptoms that the children had, emphasis should not be placed on any one approach or theory.[24] "Therefore, our general objectives should be experimentation in the areas of organization, materials, methods and techniques."[25] The remainder of this chapter will be presented under two major headings. The first section concerns a suggested approach by the writer: a suggested supplement of visual perceptual activities for the remediation of specific reading problems to be utilized by teachers of the primary grades with learning disabled children. The second section will discuss other factors that should be taken into consideration for the remediation of these particular type problems.

II. A Suggested Reading Supplement of Visual Perceptual Activities for the Remediation of Specific Reading Problems

Some teachers may feel somewhat unknowledgeable about teaching visual perceptual skills, as they may not have re-

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[24]Mary Burg, Handbook for Teachers of Children with Specific Learning Disabilities (Ohio: Hamilton County Public Schools, 1969), p. ii.

ceived training in such strategies in their formal teacher training programs and may not understand the theory underlying perceptual training.[26] In this section, the writer attempted to show the classroom teacher how visual perceptual training could be easily implemented within the regular reading program. The visual perceptual skills and their definitions used in the following outline were those suggested by Valett.[27] The reading skills suggested by Cohen[28] and Dechant[29] were used as references by the writer. A correlation was made by the writer showing how each visual perceptual skill could have a bearing upon specific reading skills, and then she suggested activities for enhancing these skills. Some of the activities have been used or suggested by other authors. However, most of the activities suggested by the writer were purposely selected for using a basal reader in order to demonstrate to teachers the ease with which these skills could be taught. There are other numerous materials and suggested activities available commercially, that have been identified by authors in the field, which could be utilized

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[26]Sam D. Clements, "Minimal Brain Dysfunction--The Problem" (speech presented at the Annual Forum of the National Conference on Social Welfare, Dallas, Texas, 1967), p. 6.

[27]Robert E. Valett, The Remediation of Learning Disabilities (California: Fearon Publishers/Lear Siegler, Inc., 1967), pp. 27-36.

[28]S. Alan Cohen, Teach Them All to Read (New York: Random House, Inc., 1969), pp. 187-91.

[29]Emerald V. Dechant, Improving the Teaching of Reading (Englewood Cliffs, N.J.: Prentice-Hall, 1970), pp. 262-64.

for teaching these skills.[30]

Visual Skill: Visual Acuity.

Definition: The ability to see and to differentiate meaningfully and accurately objects in one's visual field.

Reading Skills Enhanced: Interpretation, utilization and appreciation skills. Holds material at appropriate working distance. Comprehension skills. Does not mispronounce similar words.

Activities:

1. Ask the child to describe a picture in his reader. Ask the child what preceded it and what might come next.
2. Ask the child to pick out any object in a picture. Ask the child what is "behind," "in front of," "beside," etc., the object.

Visual Skill: Visual Coordination and Pursuit.

Definition: The ability to follow and track objects and symbols with coordinated eye movements.

Reading Skills Enhanced: The ability to attend to sequentially-arranged symbolic learning material such as reading matter by moving the eyes from left to right and making accurate return sweeps. Related to attention span and rate of comprehension skills. Without this skill the amount of information obtained by the child will be re-

[30]See Chapter II, "Methods and Materials," pp. 50-65.

duced. A deficiency in this skill can become a great deterrent to all judgments of spatial orientation, relationships, depth perception and the immediacy and accuracy of clear, single vision for almost every object or symbol in the usual classroom program. Does not repeat letters or omit letters in words.

Activities:

1. The pupil tracks reading material in his reader following penlight or pointer as directed by teacher.
2. Worksheet variation: Have pupils complete any sequence where they must begin at the left and finish at the right.

Visual Skill: Visual Form Discrimination.

Definition: The ability to differentiate visually the forms and symbols in one's environment.

Reading Skills Enhanced: The ability to see likenesses and differences in letters, words, numbers and pictures. The ability to recognize a letter or word when written in different sizes, cases, or colors. The ability to recognize a word in varying contexts. Necessary for comprehension. Allows the child to relate his primary experiences to the pictures and words he sees on the printed page of all his classroom books.

Activities:

1. Ask the pupil to point out things in a picture such as "Point out the big house on the hill."

2. Have pupil differentiate objects in a picture in his reader (in "front" and "back," "under," etc.).
3. Have pupil differentiate and trace with fingers objects in the foreground and background of pictures.
4. Let the child move a finger from word to word or use a liner when reading.

Visual Skill: Visual Memory.

Definition: The ability to recall accurately prior visual experiences.

Reading Skills Enhanced: Reading Study Skills such as organization skills--the ability to retain and apply what has been read. Categorizing skills such as classifying things under general headings. Memory of letters, words, and phrases. Recall where he has stopped in his book from visual cues. Necessary for comprehension.

Activities:

1. Have pupil look at a picture in his reader, then close the book and recall what he saw.
2. Have the pupil recall the sequence of events that happened in a story.
3. Make word cards from the basal reading word list and arrange them in chalkboard tray. Expose them to pupil for ten seconds. Shuffle and have child rearrange them.
4. This same activity can be used for letter sequences.

5. Open basal reader to a given page and have pupil scan it for a few seconds. Close book and then request the child to find the page through visual memory.

Visual Skill: Visual-Motor Fine Muscle Coordination.

Definition: The ability to coordinate fine muscles such as those required in eye-hand tasks.

Reading Skills Enhanced: The skill of letter and word transfer or copying words. (Also writing, cutting and tracing.) A prerequisite to academic success. Enhances the ability to make visual discriminations of the size, shape, texture and location of objects. With this skill comes the accuracy of eye-hand integrations, in producing drawn and written symbols which is developmentally essential and preparatory to the visual interpretations of words and numbers appearing in workbooks and texts.

Activities:

1. Print or write words from basal reader on the board. Have pupils come to board and trace words with fingers and then with chalk. Pupils then copy words on paper at their seats. Eventually, let pupils copy words from memory.
2. Outline forms from pictures in basal reader. Let pupil follow the dots.

Visual Skill: Visual-Motor Spatial-Form Manipulation.

Definition: The ability to move in space and to manipulate three-dimensional materials.

Reading Skills Enhanced: This visual skill aids in the prevention and remediation of reversing letters and numbers. The ability to put letters of a word in the proper order.

Activities:

1. Have pupils copy a three dimensional figure or picture from their reader. Tracing with finger may be necessary first.
2. Have pupil reconstruct this figure or picture with blocks, tinker-toy construction projects or modeling clay.
3. With hammer, nails and handsaw, pupil cuts, nails, and joins wood in imitation of simple projects.
4. Cover pictures on page to decrease distractions.

Visual Skill: Visual-Motor Speed of Learning.

Definition: The ability to learn visual-motor skills from repetitive experience.

Reading Skills Enhanced: Pupil can respond with increasing speed to rote learning tasks such as copying letter or word sequences. Scanning of materials so the greatest amount of information may be obtained by the child with the least time and effort.

Activities:

1. Most visual-motor skills can be improved through refined practice and drill. The specific skill to be learned must be broken down into its component movements or processes and a systematic approach developed to accomplish the task to the point of overlearning. Both meaningful practice and drill must be utilized in order for the skill to be developed for functional use.
2. Arrange a box of varied-size letters or words from basal reader. Have pupil sort into proper boxes keeping record of time. Reward pupil for improving time performance.
3. Have pupil copy random letters or words from board and time him. Reward him for improved speed of accurate performance.

Visual Skill: Visual-Motor Integration.

Definition: The ability to integrate total visual-motor skills in complex problem solving.

Reading Skills Enhanced: Creative expression: dramatization, team sports, drawing accurate pictures, playing a musical instrument, writing extended letters, and other applied skills related to reading which are necessary to build deeper levels of comprehension.

Activities:

1. Request pupils to draw pictures of the characters in their basal reader. For each child with unusual difficulties, point out body parts and request pupil to include them in the drawing.
2. Extend drawings to paintings on large art paper. Have class work on painting large picture with each character named. Have one pupil draw or paint part of a figure with another pupil completing the picture.
3. Write simple words and sentences in both manuscript and cursive writing on the chalkboard and have pupils copy them in crayon on art paper; do the same with pictures and have pupils cut up paper into puzzles and reassemble.

III. Other Factors to Take into Consideration in Remediating Children with Visual Perceptual and Reading Problems

Training in visual perception has followed a developmental plan.[31] The reader should keep in mind that the preceding material presented by the writer was but a small fragment of visual perceptual training.[32] Training began with sensory-motor training. Included were the development of

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[31]Koetting, op. cit., p. 30.

[32]Irving J. Peiser, "Vision and Learning Disabilities," Journal of the American Optometric Association, XLIII (February, 1972), 158.

physical skills and suggestions for muscle coordination and eye movements. Exercises with three dimensional objects preceded and accompanied the paper and pencil exercises, since concrete manipulation helped to develop visual perceptual skills. The instructions guided the child in the acquisition of such abilities as shifting and focusing attention, classifying, paying attention to stimuli and following directions.[33]

The teaching of form perception should follow emphasizing recognition, matching, copying and recall. Concrete forms should be used first. The concrete forms should be superimposed on a stencil sheet and then copied.[34]

Initial steps in visual perceptual training involved teaching discrimination of form-integrated into a categorical reference and reinforced through tactile experiences. Perceptual training should be tied in with what is important for the child, such as sorting silverware, or helping a child to read or write a story about himself, to construct a model, solve a puzzle or cut a pattern for a doll. Visual perceptual training on stenciled sheets proceeded in easy, graduated steps with likenesses and differences of form to letter-like form and then went directly into discrimination and learning of letters and numbers. These exercises were considered important for simple discrimination, position in

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[33]Selma G. Sapir, "A Pilot Approach to the Education of First Grade Public School Children with Problems in Bodily Schema, Perceptual-Motor and/or Language Development" (Scarsdale, N.Y.: Columbia University and Union Free School District No. 1, April, 1967), p. C-7.

[34]Ibid.

space and a direct progression into the skills area.[35]

All visual training work involved bringing the foreground sharply into focus, getting the child to attend visually to a stimulus and to disregard background. Importance was placed in beginning with clear, uncluttered backgrounds outlined in black.[36]

Both spatial relationships and figure-ground perception involved the perception of relationships. Different parts were perceived simultaneously but in temporal sequence and integrated step by step into a total picture. A sequence of eye movements was involved in the perception of the simplest geometric figures. Filling in missing letters in a word was another way of focusing attention to the details and perhaps sharpening the visual memory image. Writing a word was helpful not only because of kinesthetic feedback, but because each letter had to be remembered and reproduced when the child had to look at a copy of the word immediately before he wrote it. If he could not write it, tracing it and copying it could prepare him for writing it. Confusion of reversed images, right-left confusion, should be worked on by wearing a ring or bracelet on the dominant hand in writing and tracing the confused letters. A tracing poster in the classroom could encourage frequent practice. Letters should be traced or copied in various sizes on the blackboard, on paper, or in the air.[37]

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[35]Ibid., pp. C-7, C-8. [36]Ibid., p. C-9.

[37]Ibid., p. C-9, C-18.

The final stage was the development of conceptualization: that was, when the child could process and integrate information through the sensory modalities, he was then exposed to the formulation of concepts or ideas through the use of his percepts or sensory modalities.[38]

"Despite the importance of adequate visual development in learning, it would be presumptuous to assert that this is the sole factor."[39] Most of the children with learning problems had a multitude of other related disorders. Also, in evaluating reasons for a child's learning disabilities, consideration must be given to home environment, experiential "grey matter," general physical health and development and good teaching techniques.[40]

Wold stated:

> Yet, to ignore the sense that is vital to the primary processing of the stimulus and to ignore the efficiency of processing the input because the eyeball itself is normal may very well be a catastrophe for large numbers of basically normal children. Normal means that no measurable brain damage, cerebral palsy, deafness, sight loss, etc., is present and on intelligence testing the child has near average to above average potential.[41]

An educational program's purpose should be to develop the individual child to the fullest extent of his physical, mental, social and emotional ability in order to meet his

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[38] Ibid., p. C-19. [39] Peiser, loc. cit.

[40] Ibid.

[41] Robert M. Wold, "Vision and Learning: The Great Puzzle--Part I," The Optometric Weekly, LXII (October, 1971), 37.

needs and to foster successful achievement.[42] Perceptually handicapped children needed understanding, support, encouragement, freedom from serious guilt feelings, and modification of their instructional programs. Teachers should demonstrate their approval of and love for the child as a person, regardless of his limitations. They should recognize and praise his successes and provide abundant opportunity for him to engage in activities that he performed best. According to Cline, the most supportive learning activities were those that were self-rewarding. Every child, and especially the handicapped one, needed a series of daily, successful experiences from which he derived satisfaction and pleasure. Most important, he must learn that the path to overcoming his handicaps lay in determination, planning, and diligence. The classroom teachers must provide programs for such individuals, regardless of the exact cause of their disability.[43]

Recently, some research refocused attention on the neglected area of individual differences among children. Many children did not respond successfully to the usual approach of teaching through auditory and visual avenues. The addition of methods of teaching which involved senses other than sight and hearing have been found helpful for some children. Some

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[42]William E. Ferinden, Donald Van Handel, and Thomas Kovalinsky, "A Supplementary Instructional Program for Children with Learning Disabilities," Journal of Learning Disabilities, IV (April, 1971), 20.

[43]Betty Smith Cline, "Specific Learning Disabilities," Today's Education--NEA Journal (January, 1972), 21.

perceptually handicapped children needed many more repetitions than unimpaired children. They had to read new words frequently before they could retain them as part of the sight vocabulary. The distractible child, on the other hand, needed a minimum of stimuli. If the pupil was extremely hyperactive, he sometimes required a one-to-one teacher-student relationship. Instruction should be meaningful so that it could achieve independence from its original substance and thereby be translated to other media. Once a child has formed a certain structure, he will be able to apply it in other areas.[44]

"More and more is heard of the 'team approach' as an effective way to help children learn and achieve at more nearly their maximum potential."[45] As a result, an increasing number of significant programs, involving multi-disciplinary teams, have been reported in the literature of the "helping professions." Many children with perceptual problems of a more serious nature should be referred to a specialist for a complete evaluation of their vision, as educators have not had the equipment or knowledge to evaluate and remediate these more serious problems. One such "helping profession" was Optometry. "Optometric vision training is the remedial therapy designed to teach the child proper use of his visual mechanism so that he can effectively respond to standard academic teaching procedures."[46] Today, despite the limited

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[44]"Learning Difficulties" (Louisville, Ky.: Jefferson County Board of Education, 1969), p. 5; and Cline, op. cit., p. 22.

[45]Shearer, op. cit., p. 1. [46]Peiser, op. cit., p. 157.

number of situations wherein many disciplines have cooperated in such evaluation and programming, appropriately disposed parents and teachers and other professionals have been working toward the goal of cooperative effort. In the final analysis, there should be complete interdisciplinary cooperation among all of the professions concerned with the child's future: optometry, pediatrics, neurology, speech therapy, and others.[47]

Getman stated:

> Somehow, the idea that a child will receive meaning out of his experiences and books must be eliminated. We must establish the concept that each child can bring only his own meanings to an experience or a book. We have also forgotten the old and completely reliable rule that we must begin where the learner is. Any procedure that begins where we think the learner ought to be can no longer be accepted or justified.
>
> Hopefully, in the effort to become true teachers of children, we will once again realize that we actually teach children nothing--we can only so arrange situations and conditions that each child can bring what he already knows to the learning opportunity--and thus become a learner.[48]

One of the purposes of this study was to illustrate that an ordinary teacher could do a great deal to help a perceptually handicapped child. The teacher needed to observe the strengths and learning needs of the child, to outline the objectives of special help in specific terms, and to break down these objectives into small, reachable steps.[49]

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[47]Shearer, loc. cit., and Peiser, op. cit., p. 158.

[48]G. N. Getman, "Recipient or Participant?" Journal of Learning Disabilities, III (January, 1970), 41.

[49]Catherine Morsink, "The Unreachable Child: A Teacher's Approach to Learning Disabilities," Journal of Learning Disabilities, IV (April, 1971), 40.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. Summary

The purpose of this study was to investigate the theories, methods, materials and suggestions offered by various authors and school systems with existing programs in the area of visual perception, and to interpret the findings, thus suggesting a supplementary reading program that can be utilized by the primary classroom teacher for children with visual perceptual problems.

Specifically, the following information was sought:

1. Theories and educational philosophies of diverse authors concerning the nature and treatment of visual functioning and learning.
2. A list of characteristics that can be used as guidelines by the classroom teacher for the identification of children with learning disabilities and visual-perceptual or reading problems.
3. A suggested list of tests for remedial diagnosis so that an individualized remedial program for each child can be prescribed.
4. Methods, materials and suggestions used or recommended by researchers, specialists, school systems,

or authors in the field of visual perception and reading, to help children with these particular type problems.

5. The educational, developmental or psychological changes noticed in children participating in pilot study research designs and existing programs in school systems having classes set up for children with these particular type problems. Where available, the statistical analysis of success that was measured because of using these methods, materials and suggestions was presented.

Data from research studies were secured from libraries, conferences, personal reference material, State Education Departments, the Eric System, periodicals, books and any other sources where pertinent information was available. Data relating to this investigation were reviewed.

Letters were sent out to authors and school systems explaining this study and requesting the following information: methods and procedures used to help children with these particular type problems; educational, developmental and psychological changes noticed by using these procedures; and the results or statistical analysis of success measured because of using these methods and procedures.

The major findings of this study were:

1. One in every fifteen children in the nation's schools identified as normal in sensory, physical, and intellectual attributes were not progressing

academically in accordance with their potential.

2. Many of the children who were not succeeding academically were found to have multiple deficiencies, among them: problems of concept formation, oral and written language, emotional and social problems; disorders of attention and concentration, motor function, and thinking processes.

3. Many of the children who were not achieving to their potential were misplaced in classrooms for the retarded, retained in grade for a year or more, or passed on automatically with their age group.

4. Some children had normal sight who were found to have visual-perceptual and reading problems.

5. Vision was a part of perception and reading was a very complex perceptual, cognitive, and affective task which relied primarily on the visual process.

6. Vision developed maximally between the ages of three and seven years of age in some ordered, developmental sequence.

7. All visual skills and functions were related with one another, with other sensory and motor functions, and with all other systems and modalities of the child.

8. Some children with visual-perceptual disorders received diagnostic evaluation and remediation from specialists in the field of vision.

9. The findings of the pilot research designs in this study showed that the primary classroom teacher could successfully identify and remediate children with visual-perceptual

and reading problems.

10. The findings of the pilot research designs showed that training in bodily parts, right-left awareness, tactile, kinesthetic, visual and auditory perception, and language did help children to mature developmentally, increase their attention span, increase their competence in visual perception, achieve academically and increase in their performance of reading skills.

11. Many children with visual perceptual and reading problems were found to have lack of self-confidence, poor self-image, disorders of attention, excessive variation in mood and low tolerance for frustration.

12. There were differing opinions by the authorities cited in this study as to whether or not all children with reading problems also encountered visual-perceptual problems.

II. Conclusions

Based on the findings of this investigation, the following conclusions were drawn.

1. Many children in the nation's schools identified as normal were not achieving to their potential due to the lack of qualified teachers and adequate programs for the identification and remediation of visual-perceptual handicapped children.

2. The problems that the children not working up to their potential encountered affected their academic growth in writing, spelling, arithmetic and particularly reading,

and also their social and emotional development.

3. Many children who had been diagnosed as having reading problems may have had visual-perceptual problems which could have been the underlying cause of the reading difficulties.

4. Since children spent a good share of their time in the primary classrooms during the formative stages of visual-perception, the responsibility for the essential development of visual perceptual and reading skills would seem to fall upon schools and particularly upon the primary classroom teachers.

5. In identifying and remediating children with visual-perceptual and reading problems, the "whole child," his sensory integrity, health, neurological integrity, intelligence, language, home environment, educational background and achievement, personality, motivation, his learning patterns and other aspects of behavior should be considered.

6. The services of other professionals who were specialists in a given field were sometimes important for a more complete diagnosis and remedial program.

7. The curriculum techniques in the primary classroom needed modification for the identification and remediation of children with visual-perceptual and reading problems.

8. The personality and attitude of the primary classroom teacher and the classroom environment were important factors in the rehabilitation of children with visual-perceptual handicaps.

9. There was inconclusive evidence as to the degree of relationship that visual-perceptual deficits had upon reading deficits.

III. Recommendations

One of the major justifications for this investigation was to assist primary classroom teachers in planning a program of identification and remediation for children with visual-perceptual and reading problems. The following recommendations were recorded for this purpose:

1. Teacher training institutions should introduce new courses on the developmental principles of visual perception and programs for the identification and remediation of visual-perceptual and reading problems.

2. School systems and primary classroom teachers need to assume greater responsibility in becoming more knowledgeable about visual-perceptual problems and how they relate to academic achievement.

3. School systems and primary classroom teachers need to assume greater responsibility for implementing programs for the identification and individualized remediation of visual-perceptual and reading problems.

4. There should be in-service training in schools and a general up-grading of the professional's knowledge of the visual-perceptual handicapped child and teaching and management techniques that will lead to the child's success in school.

5. Many State Education Departments should reevaluate the certification requirements for teachers intending to work with children having visual-perceptual handicaps.

6. A preventive pre-school training program for the enhancement of visual-perceptual skills and for the early identification and remediation of visual-perceptual problems should be instituted, either by school systems or community projects.

7. Parents need to assume a greater responsibility in becoming more knowledgeable about the development of visual perception so as to play a more active part in the early identification and remediation of visual-perceptual and reading problems.

8. The primary classroom teacher should use the guidelines suggested by Clements[1] which appear on page 43. for identifying children with learning problems. Some of the characteristics suggested by Clements that should be used for identifying children with visual-perceptual problems are listed below:

a) Impaired discrimination of size.
b) Impaired discrimination of right-left and up-down.
c) Impaired tactile discrimination.
d) Poor spatial orientation.
e) Impaired orientation in time.
f) Distorted concept of body image.
g) Impaired judgment of distance.
h) Impaired discrimination of figure-ground.

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[1]Sam D. Clements, Minimal Brain Dysfunction in Children: Terminology and Identification; Phase One of a Three-Phase Project (Washington, D.C.: U.S. Government Printing Office, 1966).

i) Impaired discrimination of part-whole.
j) Frequent perceptual reversals in reading and in writing letters and numbers.
k) Poor perceptual integration. Child cannot fuse sensory impressions into meaningful entities.
l) Poor fine or gross visual-motor coordination.
m) Reading disabilities.

9. The primary classroom teacher should use the list of symptoms suggested by the American Optometric Association[2] as a guide to vision problems.

Observed in Reading:

Dislike for reading and reading subjects.
Skipping or re-reading lines.
Losing place while reading.
Slow reading or word calling.
Desire to use finger or marker as pointer while reading.
Avoiding close work.
Poor sitting posture and position while reading.
Vocalizing during silent reading, noticed by watching lips or throat.
Reversals persisting in grade 2 or beyond.
Inability to remember what has been read.
Complaint of letters and lines "running together" or of words "jumping."
Holding reading closer than normal.
Frowning, excessive blinking, scowling, squinting, or other facial distortions while reading.
Excessive head movements while reading.
Poor perceptual ability such as confusing "o" and "a"; "n" and "m"; etc.

10. In diagnosing and identifying a child with visual-perceptual and reading problems, the list of diagnostic tests, suggested by the School District in Skokie, Illinois,[3] should be referred to in order to evaluate the "whole child."

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[2]See list on page 47, above.

[3]See list on page 48, above.

11. When planning remediation, the primary classroom teacher should gather information about a child's learning by task analysis, suggested by Johnson.[4]

a) The teacher should look at the nature of the input, meaning does the task involve one modality or two or more modalities?
b) Note whether the task is verbal or nonverbal.
c) Note whether a task is meaningful or nonmeaningful.
d) Note whether the impairment occurs primarily at the level of perception, memory, symbolization, or conceptualization.
e) Examine the mode of response which can be of three major types:
    1) Recognition, manipulation, gesture or pantomime;
    2) Oral (spoken);
    3) Visual-motor (written).

12. In beginning a program for remediation, the teacher should begin at the stage of development which had not been satisfactorily completed and should follow the suggestions offered by Burg.[5]

a) Begin where the child is able to have success.
b) Be sure the child understands what he is expected to do. Demonstrate rather than talk.
c) Vary the techniques used and shorten assignments.
d) Use all the senses of the child to help him learn by means of concrete experiences.
e) Use materials that involve fine motor activities such as puzzles, blocks, and peg boards.
f) Keep records of daily work, including anecdotal records.
g) Be firm but supportive.
h) Have the child correct each mistake.
i) Set time limits when each job must be completed.
j) Build on child's strengths to correct and improve his weaknesses.
k) Observe carefully. The student will show you when he is ready or needs to go back.
l) Do not make the child feel hurried or anxious. Remember this has probably been his past experience when he has failed.
m) Ask yourself "Why?" if a child fails a task.

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[4]See page 50, above.

[5]See page 51, above.

n) Make daily plans for each child.
o) Keep samples of each child's work.
p) Make all activities individual and highly structured at first. Each child needs to strengthen his self-image before he will be able to meet with a group.

13. In identifying and remediating children with visual-perceptual and reading problems there should be a referral, conferences and complete interdisciplinary cooperation between all of the professions such as optometry, pediatrics, education, speech therapy, neurology and parents, who are concerned with the child's future.

14. Children with more serious reading problems should be referred to specialists for a complete evaluation of their vision, mental and physical health.

15. A variety of materials, such as those suggested in Chapter II, should become a part of all primary classrooms to be used as an aid in teaching visual-perceptual skills.

16. The curriculum for the primary grades should be modified to include a motor program, a visual training program and a language-auditory-visual perception program.

17. Primary classroom teachers, professionals helping visual-perceptual handicapped children, and parents should be understanding, alert, supportive and encouraging; the classroom atmosphere should be motivating, creative, stimulating and friendly.

18. The writer suggests that all elementary schools develop a research design within the school to accurately identify the relationship between visual-perceptual problems

and reading deficits and to aid in planning a program of identification and remediation of visual-perceptual and reading problems for the particular needs of the children in that school.

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