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AESTRACT

This annotated bibliography contains both opinion and research articles dealing with various aspects of vision. The entries are divided into four categories: visual acuity, visual perception, perceptual motor development, and eye movements. Within each category are entries presenting controversial and contradictory viewpoints and evidence enabling the reader to peruse many opinions while forming hiw own. (TO)

READING RESEARCH PROFILES
A Bibliography Series
of ERIC/CRIER+IRA

VISION—VISUAL DISCRIMINATION

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The International Reading Association attempts, through its publications, to provide a forum for a wide spectrum of opinion on reading. This policy permits divergent viewpoints without assuming the endorsement of the Association.

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Contents

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Introduction

This bibliography has been divided into four large categories all loosely tied together in that they deal in some way with the functioning of the eyes in reading. The first category, *Visual Acuity*, might be of special interest to individuals working directly with children who are blind, partially sighted, or who have some other problem of a visual efficiency order. It might also be of use to professionals in such related areas as optometry or ophthalmology or to school personnel interested in appropriate screening procedures to identify children and youth with visual anomalies that could interfere with reading.

Other sections are offered for researchers who wish to build upon previous findings or by consumers of research interested in making decisions relative to curriculum. In particular, the categories labeled *Visual Perception* and *Perceptual Motor Development* might be of help to someone attempting to make decisions about the content of a readiness program. The last category, *Eye Movements*, is of potential value to readers who are interested in the reading process itself or in eye movements as they relate to the reading process.

All research has limitations. In some cases these limitations are reflected in poor measuring instruments, bias on the part of the researcher, poorly defined terminology, or an ill-conceived and designed research study. In other instances, the limitations may be the result of some other factor such as the assumptions underlying the study or the use of a limited population sample. In any event, the results often lead to conflicting findings in studies dealing with seemingly similar topics. Although generalizations are sometimes difficult to defend because one can always find exceptions, the writing in the areas of visual perception and perceptual motor development probably lends itself to criticism more than does that in almost any other area in the field of reading. In these areas the research has, for various reasons, often been questionable and has occasioned distressingly opinionated statements. The person who attempts to synthesize this literature will find it a difficult task, indeed.

In part, the problem is one of confused terminology and poor or questionable instrumentation. Measures that purport to assess eye-hand dominance, for example, are often assessing preference. Visual perception takes on differing meanings for different individuals. Thus, rather than talking to one another, we often talk past one another. In addition, research and writing in the area of perceptual training are sometimes done by individuals who are sold on the particular approach and want to "prove" it effective. For these and other reasons, the consumer needs to view materials in the visual perceptual area with a particularly critical eye.

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Our own biases often determine what we look for and what we find. The reader who enters this literature closed-minded will leave that way; the reader who enters open-minded will probably come out of the reading frustrated by the knowledge that we do not have many answers and aware that there are sharply differing points of view. Such an awareness is good. It helps us come to the realization that there are no simple, single solutions to complex problems and that there is healthy controversy.

In the areas of visual perception and perceptual motor development, then, several things probably need to be done. First, the terminology needs to be clarified so that there is consistency of meaning. Second, instrumentation needs to be developed that assesses what we want it to; in other words, valid instruments need to be developed. Third, research that is carefully designed and longitudinal in nature would give us a firmer basis upon which to make decisions. Modalities may not be consistent in young children. Little evidence exists that tells whether a child remains strong in one modality or changes. Fourth, research is desperately needed on the effect of instruction on such areas as modalities; i.e., do they change as a result of instructional procedures? Fifth, considerably more replication research is needed. First attempts are often done by cultists. Careful replication studies by less personally involved scientists give us better answers. Indeed, we probably should not make decisions about programs until we have a fair amount of evidence to substantiate a stand.

In summary, this bibliography contains a broad spectrum of articles, both opinion and research, all dealing with some aspect of vision. Various categories within the bibliography present particularly controversial and contradictory viewpoints and evidence. It is hoped that the reader will enter these categories with an open mind, and read critically and reflect thoughtfully on what he finds within them.

Part I

Visual Acuity

This section of the bibliography has been divided into two sub-categories. Section 1 has materials in it that are related to the reading of blind and partially sighted individuals. The second section contains articles that discuss visual acuity and efficiency as they relate to reading. Included in this later category would be such topics as aniseikonia, accommodation and convergence, suppression, and binocular coordination.

Section 1: The Blind and Partially Sighted

Bateman, Barbara D. *Reading and Psycholinguistic Processes of Partially Seeing Children.* CEC Research Monograph No. 5. (Washington, D.C.: National Education Association, Council for Exceptional Children, 1963) 46 p.

Makes a comparison of the test performance of 131 pupils in grades 1 through 4 enrolled in 20 classes of partially seeing pupils, with the norms of the tests.

Berger, Allen. "Evaluation of an Informal Reading Inventory for the Blind," *The Psychology of Reading Behavior,* G. B. Schick and M. M. May, Eds. Yearbook of the National Reading Conference, 18 (1969) 200-06.

Compares a Braille Informal Reading Inventory, constructed by the author, to reading comprehension and word meaning scores on standardized Braille achievement tests for 147 blind children (86 boys and 61 girls).

Birch, Jack W. *School Achievement and Effect of Type Size on Reading in Visually Handicapped Children.* 166 p. (CRP-1766, Br-5-0367, OEC-4-10-028, University of Pittsburgh, School of Education, 1966) ED 010 274, microfiche $0.65, hard copy $6.58 from EDRS.

Studies the relationship between visual deficits and achievement using 424 partially seeing children from the fifth and sixth grades and investigates best type size and child's reading distance.

Bixler, Ray H., *et al. Comprehension of Rapid Speech by the Blind, Part 1.* 46 p. (CRP-1005-Pt. 1, Louisville University, Kentucky, 1961) ED 003 003, microfiche $0.65, hard copy $3.29 from EDRS.

Investigates reading comprehension of some 290 braille-reading blind children of both sexes from sixth-, seventh-, and eighth-grade residential schools for the blind,

part of whom read braille selections and the rest who heard the same selections at varied rates.

Lowenfeld, Berthold; Abel, Georgie Lee; and Hatlen, Philip H. *Blind Children Learn to Read.* (Springfield, Illinois: Charles C. Thomas, 1969) 185 p.

Explores the present status of braille reading in local classes and residential schools for blind children and determines, on the basis of 337 questionnaires and scores on two reading tests of 100 fourth and eighth graders, the characteristics of efficient readers and effective instructional techniques.

Nolan, C. Y. and Ashcroft, S. C. "The Visually Handicapped," *Review of Educational Research,* 39 (n.m. 1969) 52-70.

Includes a review of research done in tactile reading between 1966 and 1968 in a general review of studies related to the visually handicapped.

Nolan, Carson Y. "Blind Children: Degree of Vision, Mode of Reading—A 1963 Replication," *Optometric Weekly,* 57 (September 8, 1966) 29-34.

Compares data on enrollments of blind children as of January, 1960, with those of January, 1963, with regard to level of vision, mode of reading, and grade distributions.

U.S. Department of Health, Education, and Welfare. *Blind Children: Degree of Vision. Mode of Reading.* (Washington, D.C.: U.S. Government Printing Offices, 1961) 37 p.

Reports a survey of pupils in five states registered with the Office of Education by the American Printing House for the Blind made to determine visual acuity in relation to reading of print, braille, or both.

Section 2: Visual Acuity and Efficiency

Anapolle, Louis. "Visual Skills Survey of Dyslexic Students," *Journal of American Optometric Association,* 38 (October 1967) 853-59.

Ascertains the effects of fusion amplitude, heterophoria, amblyopia, and other manifestations of stress on the visual performance of the reading task of 207 dyslexic students (178 males and 29 females) ages 8 to 18 years during three summers at a camp for remedial reading therapy.

Ashcroft, Samuel C. and Harley, Rendall K. "The Visually Handicapped," *Review of Educational Research,* 36 (February 1966) 75-92.

Reviews 93 research studies in the area of the visually handicapped, published since

1963, and categorizes them under four main headings: general aspects, psychological aspects, education, and the multiply handicapped.

Ashlock, Patrick. "The Visual Perception of Children in the Primary Grades and Its Relation to Reading Performance," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 331-33.

Studies primary grade subjects who had no known learning handicaps in order to learn more about unimpaired visual perceptual development.

Beck, Harry S. "The Relationship of Symbol Reversals to Monocular and Binocular Vision," *Peabody Journal of Education*, 38 (November 1960) 137-42.

Makes a report of the number of reversals when symbols were presented binocularly and monocularly and to the dominant eye and the nondominant eye to 44 second-grade children with mixed and established laterality and who all had average intelligence and reading achievement.

Bing, Lois B. "Bibliography: Visual Problems in Schools, 1945-1950," *Journal of the American Optometric Association*, 22 (May 1951) 596-605.

Classifies the references cited under the following major headings: causal factors in reading difficulty, eye-movement studies, perception, physical factors, reading rate, reading readiness, visual fatigue, and visual surveys in schools.

Bing, Lois B. "A Critical Analysis of the Literature on Certain Visual Functions Which Seem to Be Related to Reading Achievement," *Journal of the American Optometric Association*, 22 (March 1951) 454-63.

Summarizes the essential findings of the relation of such visual functions as visual acuity, refractive errors, binocular coordination or muscle imbalance, fusion, and visual fields to reading achievement, and suggests possible explanations for wide differences in results.

Bing, Lois B. "Vision Readiness and Reading Readiness," *Improvement of Reading Through Classroom Practice*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 9 (1964) 268-71.

Investigates the complex process of vision and its relationship to beginning reading, emphasizing the role of the teacher in recognizing symptoms of visual difficulty.

Cashman, Jerome Patrick. *A Study of the Relationship Between Organic Factors, Certain Selected Variables and Progress in a Reading Improvement Program.* 120 p. (Ph.D., Fordham University, 1966) *Dissertation Abstracts*, 27, No. 6, 1648-A. Order No. 67-13, 517, microfilm $3.00, xerography $5.80 from University Microfilms.

Studies the relationship between impairment associated with brain damage and

reading disability using the four variables of mental ability, cerebral dominance, visual anomalies, and personality adjustment on 138 male college freshmen who were disabled readers.

Cleland, Donald L. "Seeing and Reading," *American Journal of Optometry and Archives of American Academy of Optometry*, 30 (September 1953) 467-81.

Summarizes the results of more than 30 studies relating to types of cues to word recognition, nature of the reading process, visual factors in reading, and effect of prolonged reading on visual fatigue.

Cohen, S. Alan. *A Study of the Relationship Among Measurements of Reading, Intelligence and Vision Development, Using a Dynamic Theory of Vision, in Socially Disadvantaged Junior High School Children.* 250 p. (Ed.D., Boston University School of Education, 1965) *Dissertation Abstracts*, 26, No. 9, 5222. Order No. 66-200, microfilm $3.25, xerography $11.25 from University Microfilms.

Reports the development and validation of a Developmental Vision Survey (DVS) and its administering along with 5 other tests and subtests to 352 seventh- and eighth-grade underachieving children, and concludes that developmental vision as defined by the study affects school achievement indirectly by affecting intelligence as measured on the Primary Mental Ability (PMA).

Deady, Marion C. "Visual Factors in Reading Disability," *The Columbia Optometrist*, 26 (December 1952) 5-7.

Discusses the nature of visual difficulties that are related to reading retardation, as reported in 11 previous investigations; suggests means of correcting and eliminating each defect.

Demilia, Lorraine A. "Visual Fatigue and Reading," *Journal of Education*, 151 (December 1968) 4-34.

Reviews 42 sources in discussing visual fatigue and reading, with special emphasis on the psychology of word perception, the determinants of legibility, and the role of various typographical factors.

Eames, Thomas H. "Accomodation in School Children: Age Five, Six, Seven, and Eight Years," *American Journal of Ophthalmology*, 51 (June 1961) 1255-57.

Presents data on the near-point accomodative ability of 899 urban and suburban children to determine their visual readiness for school tasks.

Eames, Thomas H. "Correlation Between Birth Weight and Visual Acuity: From the Age of Five Through Twelve Years," *American Journal of Ophthalmology*, 38 (December 1954) 850-51.

Compares the coefficients of correlation between birth weight and visual acuity in the case of 40 reading failures and 40 nonreading failures.

Eames, Thomas H. "The Effect of Anisometropia on Reading Achievement," *American Journal of Optometry and Archives of American Academy of Optometry*, 41 (December 1964) 700-02.

Compares the reading performances of 25 children (median Chronological Age (CA) 9.8 years) having equal refractive anomalies in each eye and 25 children (median CA 9.6) having anisometropia to determine the effect of anisometropia on reading achievement and the improvement of reading resulting from correction of refractive defects, followed by regular classroom instruction.

Eames, Thomas H. "The Influence of Hypermetropia and Myopia on Reading Achievement," *American Journal of Ophthalmology*, 39 (March 1955) 375-77.

Compares the differences between the chronological age and reading age of 64 reading failures and 57 reading nonfailures, from the third and fourth grades, grouped according to refractive condition.

Eames, Thomas H. "The Relationship of Birth Weight, the Speeds of Object and Word Perception, and Visual Acuity," *Journal of Pediatrics*, 47 (November 1955) 603-06.

Compares the speed of object and word perception and visual acuity of 25 pupils whose birth weights were less than 5.5 pounds with those of an equal number whose birth weights were 5.5 pounds or over.

Eames, Thomas H. "Visual Handicaps to Reading," *Journal of Education*, 141 (February 1959) 3-35.

Summarizes the comparative eye condition of reading failures and unselected groups of school children examined by the author over a long period of years.

Edgar, David Eugene. *Vision as It Relates to Reading at the College Level.* 159 p. (Ed.D., The University of Florida, 1965) *Dissertation Abstracts*, 26, No. 10, 5862-63. Order No. 66-2018, microfilm $3.00, xerography $7.40 from University Microfilms.

Studies the relationship between vision and changes in levels of reading skills for 180 lower third college freshmen and concludes that reading skills are relatively independent of measures of vision skills.

Edson, William H.; Bond, Guy L.; and Cook, Walter W. "Relationships Between Visual Characteristics and Specific Silent Reading Abilities," *Journal of Educational Research*, 46 (February 1953) 451-57.

Reports the results of a study to determine the relationship, if any, between

variations in 10 measures of silent reading skills and 13 tests of visual characteristics in the case of 188 fourth-grade pupils in four schools of St. Paul, Minnesota.

Efron, Marvin. "The Role of Vision in Reading Readiness," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 357-58.

Discusses generally the role of visual skills in reading development.

Goldenberg, Samuel. *A One-Year Study of the Relationship Between Changes in Visual Efficiency and Growth of Scholastic Achievement of the Fifth, Sixth, and Seventh Grades in Morris Township, New Jersey.* 188 p. (Ph.D., New York University, 1967) *Dissertation Abstracts*, 28, No. 10, 3930-A. Order No. 68-4776, microfilm $3.00, xerography $8.60 from University Microfilms.

Discovers no satisfactory statistical relationships between changes in visual efficiency and growth of scholastic achievement or any statistical interaction between sight and IQ in a study using 64 pairs of children matched for age, sex, grade, class placement, and socioeconomic level.

Gruber, Ellis. "Reading Ability, Binocular Coordination and the Ophthalmograph," *Archives of Ophthalmology*, 67 (March 1962) 280-88.

Makes an analysis of ophthalmographic records of 50 patients, ages 10 to 68 years, to determine the validity of the evidences of binocular coordination based on the findings of an ophthalmologist's examination.

Holmes, Jack A. "Visual Hazards in the Early Teaching of Reading," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 53-61.

Cites 44 references in discussing the effects of early reading on vision.

Howe, John Wesley. *The Visual Fusion Threshold (VFT) Test as a Measure of Perceptual Efficiency in Kindergarten and First Grade, and as a Possible Predictor of Later Reading Retardation.* 211 p. (Ph.D., University of Southern California, 1963) *Dissertation Abstracts*, 24, No. 2, 626. Order No. 63-5054, microfilm $2.75, xerography $9.70 from University Microfilms.

Describes the development and investigation of the validity and predictability of the Visual Fusion Threshold Test (VFT) on kindergarten and first-grade children as it relates to concurrent or subsequent reading difficulty in children younger than eight years and concludes that the VFT is related positively but modestly to the visual perceptual aspects of readiness and early reading tasks.

Huelsman, Charles B. "Some Recent Research on Visual Problems in Reading," *American Journal of Optometry and Archives of American Academy of Optometry*, 35 (November 1958) 559-64.

Summarizes pertinent research since 1960 under three headings, outline form perception, use of the tachistoscope, and general visual achievement.

Hulsman, Helen L. "Visual Factors in Reading: With Implications for Teaching," *American Journal of Ophthalmology*, 36 (November 1953) 1577-86.

Discusses the effect of visual errors in reading and the results of correcting the defects of vision, as reported in a series of studies of these problems; also the implications of the findings and conclusions for the improvement of teaching.

Hunt, Lyman C., Jr. and Sheldon, William D. "Characteristics of the Reading of a Group of Ninth Grade Pupils," *School Review*, 58 (September 1950) 348-53.

Presents an analysis of the scores of 19 good readers and 19 poor readers in the ninth grade on tests of reading, intelligence, personality, and vision.

Joslin, Ethel S. "Physical Factors in Reading," *The Columbia Optometrist*, 23 (December 1949) 6-7; 24 (February 1950) 5-6.

Presents a review of research on visual difficulties as causes of reading disability, with emphasis on visual acuity, refractive errors, myopia, astigmatism, binocular coordination, eye-muscle imbalance, fixation ability, and fusion.

Kelley, Dorothy Jones. "Using Children's School Atypicalities to Indicate Ocular Defects," *Journal of Educational Research*, 47 (February 1954) 455-65.

Correlates achievement scores in reading made by 533 pupils in grades 1 to 6 with Massachusetts Vision Test findings to determine the extent to which achievement scores and observation of visual behaviors or abnormalities could be used to indicate the presence of ocular defects.

Kingston, Albert J., Ed. "Research for the Classroom: Visual Deficiencies and Reading Disability," by Carl L. Rosen. *Journal of Reading*, 9 (October 1965) 57-61.

Presents a review of research, accompanied by a 40-item bibliography, of the role of visual deficiencies in the causation of reading disability.

Knox, Gertrude E. "Classroom Symptoms of Visual Efficiency," *Clinical Studies in Reading*, 2, 97-101. Supplementary Educational Monographs No. 77. (Chicago: University of Chicago Press, 1953.)

Presents evidence of the value of the classroom use of a check list of 30 visual characteristics as determined through its application to 126 third-grade pupils, the results of a visual screening test being reported in the case of 41 pupils, and the findings of a refractionist in 37 cases.

Koetting, James F. "Word Recognition as a Function of Locus in the Four Lateral

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Visual Fields: The Iota Phenomenon," *American Journal of Optometry and Archives of American Academy of Optometry*, 47 (January 1970) 56-66.

Investigates the relative performance in each of four lateral peripheral visual fields using three-letter English words (from Dolch Basic Sight Vocabulary) with 46 fifth-grade subjects, and found a superiority of performance in the right binocular field as compared to the left, and in the total field of the left eye as compared to the right.

Lawson, Lawrence J., Jr. "Ophthalmological Factors in Learning Disabilities," *Progress in Learning Disabilities*, Vol. 1, H. R. Myklebust, Ed., 147-81. (New York: Grune & Stratton, 1968.)

Studies a group of 82 children with learning disabilities but of average or above mental ability to determine the nature of relationships between ocular conditions and learning disabilities.

Park, George E. "Ophthalmological Aspects of Learning Disabilites," *Journal of Learning Disabilities*, 2 (April 1969) 189-98.

Synthesizes the visual process with the concept of homeostasis as applied to other physiological functions and balances and relates their influence in reading and draws eight conclusions from a review of research studies related to functional vision, visual acuity, and mirror and reversed vision in normal and dyslexic children.

Prince, Jack H. "Relationship of Reading Types to Uncorrectable Lowered Visual Acuity," *American Journal of Optometry and Archives of American Academy of Optometry*, 34 (November 1957) 581-95.

Presents experimental evidence secured to test the hypothesis "that with scientifically planned interletter spacing, print that is ordinarily visible only to subjects with emmetropia, can be made legible to subjects with a certain degree of uncorrected low visual acuity."

Richards, Oscar W. "A Comparison of Acuity Test Letters With and Without Serifs," *American Journal of Optometry and Archives of American Academy of Optometry*, 42 (October 1965) 589-92.

Compares visual acuity on the Snellen Chart for 103 persons, ages 17 to 82, when two different types of letters were shown at two luminance levels.

Robinson, Helen M., Ed. *Clinical Studies in Reading, II.* Supplementary Educational Monographs, No. 77. (Chicago: University of Chicago Press, 1953) 190 p.

Reports a series of studies of reading, with emphasis on visual problems, made by the staff members and graduate students doing work in the University of Chicago Reading Clinic.

Robinson, Helen M. "Diagnosis and Treatment of Poor Readers with Vision Problems," *Clinical Studies in Reading, II,* 9-28. Supplementary Educational Monographs No. 77. (Chicago: The University of Chicago Press, 1953.)

Presents illustrative case studies of poor readers with visual problems, describes methods of visual screening, and discusses problems involved in remedial therapy.

Robinson, Helen M. "Factors Related to Monocular and Binocular Reading Efficiency," *American Journal of Optometry and Archives of American Academy of Optometry,* 28 (July 1951) 337-46.

Analyzes data secured from 75 cases to determine if middle-grade pupils read better monocularly or binocularly and if performance on the Gray Check Tests is related to scores on visual efficiency tests.

Robinson, Helen M. "Visual Efficiency and Reading Status in the Elementary School," *Clinical Studies in Reading III,* Helen M. Robinson and Helen K. Smith, Eds. Supplementary Educational Monographs, 97 (1968) 49-65.

Calculates coefficients of correlation and factor analyses to determine patterns of visual test scores related to reading achievement at each of the first eight grades and compares performance on each subtest of 10 visual screening batteries for 63 good and 60 poor readers.

Robinson, Helen M. and **Huelsman, Charles B., Jr.** "Visual Efficiency and Progress in Learning to Read," *Clinical Studies in Reading, II,* 31-63. Supplementary Educational Monographs No. 77. (Chicago: University of Chicago Press, 1953.)

Reports the results of studies, including more than 50 pupils in grades 1, 4, and 8, to determine the relationship between visual efficiency and reading progress and to evaluate existing visual screening tests, determining their reliability and validity when used with elementary-school pupils varying in age and achievement.

Robinson, Helen M., *et al.* "An Evaluation of the Children's Visual Achievement Forms at Grade I," *American Journal of Optometry and Archives of American Academy of Optometry,* 35 (October 1958) 1-11.

Reports correlations between scores made by 87 first-grade children on a battery of tests to evaluate the children's visual achievement forms as a predictor of reading achievement, skill in handwriting, and the need for visual examination.

Rosen, Carl L. "The Status of School Vision Screening: A Review of Research and Consideration of Some Selected Problems," *The Psychology of Reading Behavior,* G. B. Schick and M. M. May, Eds. Yearbook of the National Reading Conference, 18 (1969) 42-48.

Lists and evaluates current visual screening devices and batteries available for school purposes, as well as considering the accuracy of referral of several of the standard screening tests and pertinent factors which can influence this accuracy.

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Rosenbloom, Alfred A., Jr. "Promoting Visual Readiness for Reading," *Changing Concepts of Reading Instruction*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 6 (1961) 89-93.

Discusses the importance of visual readiness and its role in visual perception and the development and correction of visual problems, and stresses the need for a complete visual examination to be given before a child enters school.

Rosenbloom, Alfred A., Jr. "The Relationship Between Aniseikonia and Achievement in Reading," *Clinical Studies in Reading III*, Helen M. Robinson and Helen K. Smith, Eds. Supplementary Educational Monographs, 97 (1968) 109-16.

Compares the incidence of aniseikonia and suppression exhibited by 40 retarded readers in grades 4 to 8 with a control group of equivalent size, age, and intelligence.

Schubert, Delwyn G. and **Walton, Howard N.** "Effects of Induced Astigmatism," *The Reading Teacher*, 21 (March 1968) 547-51.

Analyzes the difficulties which 35 seniors (ages 22 to 47) from a college of optometry encountered when taking a test while subjected to 1.00 diopter of induced astigmatism with-the-rule.

Shearron, Gibert F. "Color Deficiency and Reading Achievement in Primary School Boys," *The Reading Teacher*, 22 (March 1969) 510-12, 577.

Screens 1,295 grade 1, 2, and 3 pupils for color deficiency and investigates the difference between the reading achievement of 35 color deficient boys and 35 noncolor deficient boys.

Shulman, Paul F. "The Vision Specialist in a Remedial Reading Program," *Optometric Weekly*, 43 (December 13, 1951) 1941-45.

Reviews the results of 20 studies relating to causation of reading disability to determine if vision tests alone can diagnose reading deficiency and if there is a definite syndrome of visual factors associated with reading difficulty.

Silbiger, Francene. "Visual Test Score Differences Between High and Low Reading Achievement Groups Among College Freshmen," *College and Adult Reading*, D. M. Wark, Ed. Yearbook of the North Central Reading Association, 5 (1968) 134-45.

Inquires whether visual skills measured by the Titmus Optical Vision Tester were related to reading achievement with 38 students who scored low on a speed of comprehension test and 25 who scored high who were then each given 12 visual screening tests.

Silbiger, Francene and **Woolf, Daniel.** "Perceptual Difficulties Associated with

Reading Disability," *Proceedings of the College Reading Association*, C. A. Ketcham, Ed., 6 (1965) 98-102.

Relates reading ability and academic achievement to visual discomfort and visual disability for 90 undergraduates—37 were in a poor achievement group and 53 were in a good group.

Smith, Helen K. "Identification of Factors that Inhibit Progress in Reading," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 200-02.

Discusses methods of identifying specific factors related to reading retardation.

Smith, William. "Report of Vision Screening Tests in a Group of Ten Reading Problem Cases," *American Journal of Optometry and Archives of American Academy of Optometry*, 32 (June 1955) 295-303.

Presents 10 case studies in which both eye examination under cycloplegia and stereoscopic instrument tests were used to test the assumption that discrepancies exist between the results of the two types of examinations.

Spache, George D. "Classroom Reading and the Visually Handicapped Child," *Changing Concepts of Reading Instruction*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 6 (1961) 93-97.

Explores recent changes that have occurred in thinking about reading and the visually handicapped child and examines the problems of etiology and symptoms in adequate diagnosis.

Spache, George D. and Tillman, Chester E. "A Comparison of the Visual Profiles of Retarded and Non-Retarded Readers," *Journal of Developmental Reading*, 5 (Winter 1962) 101-09.

Presents a comparison of performance on a visual screening battery by 114 retarded readers with 101 nonretarded readers selected from files of a reading clinic.

Starnes, David R. "Visual Abilities vs. Reading Abilities," *Journal of the American Optometric Association*, 40 (June 1969) 596-600.

Describes a pilot study of the relationship between visual abilities or visual perception and the ability to learn to read among 18 third-grade students who were divided into eight good readers and 10 poor readers and tested with a group of visual abilities tests and several visual-perceptual-motor tests.

Steinbaum, Milton and Kurk, Mitchell. "Comparison of Visual Performance in Two Classes of Below Average Readers," *Journal of the American Optometric Association*, 35 (October 1956) 194-96.

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Compares the visual status of two groups of below average readers, namely, 17 fourth-grade pupils with greater average retardation in reading and 18 fifth-grade pupils with lesser average retardation.

Steinbaum, Milton and Kurk, Mitchell. "Relationship Between the Keystone Visual Skills Test with Reading Achievement and Intelligence," *American Journal of Optometry,* 35 (April 1958) 173-81.

Compares the visual scores made by 100 fifth- and sixth-grade pupils, classified into three IQ groups and into "above" and "below average" in reading, to determine the relationship between the scores on the Keyston Visual Skills Test and reading, intelligence, and reading and intelligence combined.

Steinberg, Philip M. and Rosenberg, Robert. "Relationship Between Reading and Various Aspects of Visual Anomalies," *Journal of the American Optometric Association,* 26 (March 1956) 444-46.

Summarizes relationships, based on data from 1,000 children in grades 4 to 8 inclusive, between reading ability and ocular muscle imbalances, vertical muscle imbalances, hand dominance, hand-eye dominance, and visual acuity and depth perception.

Stevens, Douglas A. and Adams, Roger L. "Improvement in Rapid Reading as Related to Visual Acuity and Initial Reading Speed," *Journal of Educational Research,* 62 (December 1968) 165-68.

Examines the increase in reading speed and comprehensions of 31 college freshmen designated as myopic and emmetropic.

Townsend, Agatha. "What Research Says to the Reading Teacher: A Bibliography on Sensory Handicaps," *The Reading Teacher,* 19 (May 1966) 677-81.

Presents an annotated bibliography of 18 reports dealing with reading research related to pupils with visual, auditory, and speech impairment.

Walton, Howard N. and Schubert, Delwyn N. "Induced Myopia and Far Point Perception," *American Journal of Optometry and Archives of American Academy of Optometry,* 42(May 1965) 311-14.

Reports a study in which the Keystone Standard Tachistoscope was used to determine what effects varying degrees of artificially induced myopia have on far point perception of 24 college seniors ranging from 21 to 38 years old and who manifested 20/20 visual acuity.

Wilson W. Keith and Wold, Robert W. "School Vision Screening Implications for Optometry," *Optometric Weekly,* 61 (May 1970) 488-93.

Reports the results of visual symptoms and visual screening of 79 middle-grade

pupils in the upper quartile in reading compared to 81 middle-grade pupils in the lower quartile (by way of the Stanford Reading Test).

Young, Francis A. "Reading, Measures of Intelligence and Refractive Errors," *American Journal of Optometry and Archives of American Academy of Optometry*, 40 (May 1963) 257-64.

Determines relationships, based on tests given to 117 pupils (ages not given), between hyperopia or myopia and intelligence (measured by the Stanford-Binet and the California Test of Mental Maturity), and obtains a partial correlation with reading held constant by use of the Durrell-Sullivan Reading Achievement Test scores.

Part II
Visual Perception

The section of this bibliography on visual perception incorporates such diverse topics as visual memory, visual modality, and visual discrimination. In particular, the user should note that there are not always sharp distinctions between articles placed in this category and those placed in Part III of this bibliogrpahy. Some citations might well have been put in both. For complete coverage of a topic, then, the user of this bibliograpy should search the citations and annotations in both parts II and III.

Aaron, I. E. "Translating Research into Practice: Reading Readiness, Visual Perception, Auditory Perception," *Perception and Reading,* Helen K. Smith, Ed. International Reading Association Conference Proceedings, 12, Part 4 (1968) 130-35.

Discusses the changes in teacher practices caused by research findings and the hazards of interpreting reading research results, and summarizes the strengths, limitations, and implications for practice of six research studies.

Arciszewski, Raymond Arthur. *The Effects of Visual Perception Training on the Perception Ability and Reading Achievement of First Grade Students.* 178 p. (Ed. D., Rutgers–The State University, 1968) *Dissertation Abstracts,* 29, No. 12, 4174-A. Order No. 69-9294, microfilm $3.00, xerography $8.20 from University Microfilms.

Studies the effects of visual perception training on the perception and reading ability of 215 first graders, and seeks correlations between factors of intelligence, perception, sex, age, and reading achievement using three groups (Frostig Program training group, intensive phonics training group, and straight basal reading instruction group) for an experimental period of 22 school weeks.

Arnold, Richard D. "Four Methods of Teaching Word Recognition to Disabled Readers," *Elementary School Journal,* 68 (February 1968) 269-74.

Compares four methods of instruction in word recognition with 12 delinquent boys, ages 11 to 16, who were disabled readers.

Ashlock, Patrick. "The Visual Perception of Children in the Primary Grades and Its Relation to Reading Performance," *Reading and Inquiry,* J. A. Figurel, Ed. Proceedings of the International Reading Association, 10 (1965) 331-33.

Reports correlations between scores of 90 first-, second-, and third-grade children on a battery of tests measuring reading performance and three types of visual perception to determine the relationship between reading and types of visual perception, and the importance of visual perception as a predictor of reading achievement.

Ashlock, Patrick Robert, *Visual Perception of Children in the Primary Grades and Its Relation to Reading Performance.* 91 p. (Ed.D., The University of Texas, 1963) *Dissertation Abstracts,* 24, No. 1, 5186. Order No. 64-6574, microfilm $2.75, xerography $4.80 from University Microfilms.

Examines the relationship between visual perception and reading performance on primary-grade pupils using a battery of intelligence, reading, and perceptual tests and reports that visual perception appears to decrease in importance as a significant predictor of reading performance as the grade level increases.

Bakker, D. J. "Sensory Dominance and Reading Ability," *Journal of Communication Disorders,* 1 (n.m. 1967) 316-18.

Relates the reading achievement scores to competency in estimating the midpoint of a bar using the visual and the tactile-kinaesthetic modality for 100 7- to 11-year-old Dutch boys and girls, matched on age.

Balmuth, Miriam. "Visual and Auditory Modalities: How Important Are They?" *Current Issues in Reading,* Nila B. Smith, Ed. International Reading Association Conference Proceedings, 13 (1969) 165-77.

Reviews research in visual and auditory modalities by investigating (1) the superiority of one modality over another, (2) the simultaneous use of different modalities, and (3) modality studies focused on reading.

Bannatyne, A. "Psychological Bases of Reading in the United Kingdom," *Reading Instruction: An International Forum,* Marion D. Jenkinson, Ed. Proceedings of the International Reading Association World Congress on Reading, 1 (1967) 327-35.

Cites 15 sources in discussing verbal and visuo-spatial ability differences in boys and girls.

Barrett, Thomas. "Visual Discrimination and Reading: An Educator's Viewpoint," *The Optometric Weekly,* 60 (October 1969) 36-41.

Analyzes the results of three discrimination studies and their relationship to success in beginning reading, with an emphasis on visual discrimination in the first study, visual and auditory discrimination in the second, and visual perception skills from the Frostig program in the third.

Barrett, Thomas C. "Performance on Selected Pre ding Tasks and First Grade

Reading Achievement," *Vistas in Reading*. J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 11, Part 1 (1966) 461-64.

Outlines a study showing predictive relationships between certain prereading tasks and reading achievement.

Barrett, Thomas C. "Visual Discrimination Tasks as Predictors of First Grade Reading Achievement," *The Reading Teacher*, 18 (January 1965) 276-82.

Uses stratified random sampling techniques to select 632 first graders in ascertaining the relative contribution and total relationship of nine reading readiness variables (seven involving visual discrimination) to predict first-grade reading achievement.

Barrett, Thomas Clifford. *The Relationship Between Selected Reading Readiness Measures of Visual Discrimination and First Grade Reading Achievement.* 237 p. (Ph.D., University of Minnesota, 1962) *Dissertation Abstracts*, 24, No. 1, 193. Order No. 63-4271, microfilm $3.10, xerography $10.80 from University Microfilms.

Investigates reading readiness factors using mainly visual discrimination measures on 632 first graders and finds statistically that the Gates Reading Letters and Numbers Test is the best single predictor of first-grade reading achievement, while the optimum combination for predicting is Reading Letters and Numbers, Pattern Copying, and Word Matching.

Barton, Melvin I.; Goodglass, Harold; and Shai, Amnon. "Differential Recognition of Tachistoscopically Presented English and Hebrew Words in Right and Left Visual Fields," *Perceptual and Motor Skills*, 21 (October 1965) 431-47.

Shows 15 Hebrew and 15 English words that were printed vertically and presented tachistoscopically and monocularly to 20 Israeli students and just the English words to 10 Americans to determine whether alphabetic material arriving in the major cerebral hemisphere is more readily identified than material arriving in the hemisphere contralateral to the language areas.

Bateman, Barbara. "The Efficacy of an Auditory and a Visual Method of First Grade Reading Instruction with Auditory and Visual Learners," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 105-12.

Involves four control and four experimental classrooms totaling 182 pupils in a study which explored the efficacy of an auditory approach compared with a visual approach to first-grade reading.

Beery, Judith W. "Matching of Auditory and Visual Stimuli by Average and Retarded Readers," *Optometric Weekly*, 61 (January 1970) 93-96.

Replicates the Birch-Belmont investigation with modifications, and compares a visual-auditory (V-A) presentation with auditory-visual (A-V) presentation using 15 retarded and 15 normal readers who ranged in age from 8 to 13 years and from 86 to 114 in IQ.

Beery, Judith Williams. "Matching of Auditory and Visual Stimuli by Average and Retarded Readers," *Child Development,* 38 (September 1967) 827-33.

Compares performance on three tasks of auditory-visual integration for 15 subjects (age range 8 years 9 months to 13 years 3 months) with specific reading disability and an equal number of controls.

Benger, Kathlyn. "The Relationhips of Perception, Personality, Intelligence, and Grade One Reading Achievement," *Perception and Reading,* Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 112-23.

Studies through linear multiple regression analysis the contribution of auditory discrimination, aural vocabulary, intelligence, teacher ratings of personality, and five aspects of visual perception in the prediction of reading scores of 30 pairs of Canadian children at the end of first grade.

Bergan, John R. *A Study of the Relationships Between Perception and Reading.* 104 p. (CRP-5-0583-2-12-1, OEC-6-10-082, Arizona University, Tucson, 1967) ED 017 435, microfiche $0.65, hard copy $6.58 from EDRS.

Deals with perception and its relationship to reading as measured by tests of intelligence, achievement, spatial relations, word reversals, and size and shape constancy on 50 second-, 56 fourth-, and 56 sixth-grade children, and finds that none of the intercorrelations of the perceptual tests was significant.

Birch, Herbert G. and **Belmont, Lillian.** "Auditory-Visual Integration, Intelligence and Reading Ability in School Children," *Perceptual and Motor Skills,* 20 (February 1965) 295-305.

Reports the significance of developmental pattern of auditory-visual equivalence among a total of 220 children in kindergarten through grade 6 and correlates the pattern scores with intellectual status and reading achievement of pupils at each grade level.

Birch, Herbert G. and **Belmont, Lillian.** "Auditory-Visual Integration in Normal and Retarded Readers," *American Journal of Orthopsychiatry,* 34 (October 1964) 852-61.

Compares the performance of 150 retarded and 50 normal readers (all boys between the ages of 9.4 and 10.4 years with IQ's higher than 80) on an auditory-visual pattern test developed by the authors to test the hypothesis that impairment in auditory-visual integration would occur more commonly in retarded than in normal readers.

Vision—Visual Discrimination

Bonsall, Cheryl and Dornbush, Rhea L. "Visual Perception and Reading Ability," *Journal of Educational Psychology*, 60 (August 1969) 294-99.

Investigates the relationship between reading ability and the developmental stage of the child as a function of task difficulty, exposure duration, and meaningfulness of visually presented material using 10 normal and 10 retarded readers from each of grades 2, 4, and 6.

Bradley, Betty Hunt. "Differential Responses in Perceptual Ability Among Mentally Retarded Brain-Injured Children," *Journal of Educational Research*, 57 (April 1964) 421-24.

Compares the performances of two groups of 35 mentally retarded brain-injured children on two tests of perceptual abilities with both groups paired in terms of chronological age, mental age, and IQ and originally differentiated on the basis of visual perceptual disabilities.

Braun, Carl. "Interest-Loading and Modality Effects on Textual Response Acquisition," *Reading Research Quarterly*, 4 (Spring 1969) 428-44.

Investigates the differential rate of acquisition and retention of textual responses categorized on the basis of sex-related interest loading by presenting the texts to a sample of 240 kindergarten children in two modalities: auditory and auditory-visual.

Breniman, Emery Richard. *Visual Discrimination Learning and Retention in Institutionalized Educable Mentally Retarded Children.* 144 p. (Ed.D., The Pennsylvania State University, 1967) *Dissertation Abstracts*, 29, No. 3, 810-A. Order No. 68-11,969, microfilm $3.00, xerography $6.80 from University Microfilms.

Deals with two samples of 45 educable mentally retarded children from two different institutions assigned to one of three treatment groups, differing only in the color of the vowels (red, blue, or black), and finds that discrimination increased with increasing dissimilarity of cues, and color produced no significant effects.

Bruner, Jerome S. and Minturn, A. Leigh. "Perceptual Identification and Perceptual Organization," *Journal of General Psychology*, 53 (July 1955) 21-28.

Reports the results of a study using 24 students as subjects to determine whether the operation of the closure principle in visual perception is affected by how the figure in which closure may occur is identified.

Bryan, Qhentin R. "Relative Importance of Intelligence and Visual Perception in Predicting Reading Achievement," *California Journal of Educational Research*, 15 (January 1964) 44-48.

Administers a battery of tests, including intelligence, readiness, visual perception, and reading achievement, to all children in kindergarten through grade 3 (N=21 to

25 per class) in a California school to determine the importance of the test scores in predicting reading comprehension and vocabulary.

Bryden, M. P. "Left-Right Differences in Tachistoscopic Recognition: Directional Scanning or Cerebral Dominance," *Perceptual and Motor Skills*, 23 (December 1966) 1127-34.

Compares left-right differences in the visual recognition of single and multiple letter stimuli for 26 right-handed undergraduates, as well as compares mean recognition scores for normally-oriented and mirror-imaged letters for 46 undergraduate subjects.

Budoff, Milton and Quinlan, Donald. "Auditory and Visual Learning in Primary Grade Children," *Child Development*, 35 (June 1964) 583-86.

Tests the hypothesis that young children learn more rapidly by auditory than by visual stimulation by giving 56 pupils, ages 7 to 8 years, paired associates of familiar three- and four-letter nouns and verbs to determine the number of trials required to obtain the criterion when each modality was used.

Budoff, Milton and Quinlan, Donald. "Reading Progress as Related to Efficiency of Visual and Aural Learning in the Primary Grades," *Journal of Educational Psychology*, 55 (October 1964) 247-52.

Compares learning efficiency of 28 average and 28 retarded second-grade readers when meaningful words were presented aurally and visually in a paired-associate paradigm.

Buswell, G. T. "The Relationship Between Perceptual and Intellectual Processes in Reading," *California Journal of Educational Research*, 8 (May 1957) 99-103.

Reports the results of studies based on the hypothesis "that difficulties in reading for many college students are due to lack of perceptual skill" which results from "the fixing of perceptual habits in the elementary school before a sufficiently high level of maturity is reached."

Catteral, Calvin Dennis. *The Effects of Pretraining in Auditory and Visual Discrimination on Texting in First Grade Boys.* 99 p. (Ph.D., University of Southern California, 1964) *Dissertation Abstracts*, 25, No. 6, 3387. Order No. 64-13, 490, microfilm $2.75, xerography $5.00 from University Microfilms.

Studies texting (i.e., reading aloud) on 120 first-grade boys of average ability and normal first-grade age who were randomly assigned to eight experimental groups, and analyzes the interaction between the auditory variables resulting in five concluding statements.

Chansky, Norman M. "Perceptual Training with Elementary School Underachievers," *Journal of School Psychology*, 1 (January 1963) 33-41.

Compares reading and spelling scores after 10 weeks of 34 under-achieving pupils, grades 3 and 4, who were placed in four groups: 12 who received remedial reading and perceptual training, eight who received just remedial reading, seven who received just perceptual training, and seven who received neither type of training.

Chirhart, Virginia J. *A Study of the Word Recognition Skills and Perceptual Abilities of Fourth-Grade Pupils.* 227 p. (Ph.D., University of Minnesota, 1966) *Dissertation Abstracts,* 27, No. 11, 3608-A. Order No. 67-6, microfilm $3.00, xerography $10.35 from University Microfilms.

Studies the relationship between certain word recognition skills and visual perception skills using 761 fourth-grade pupils, and finds that the perceptual task requiring the subject to complete a pattern correlates most highly with the achievement of word recognition skills for both sexes.

Cohen, Ruth Isenberg. *Reading Training of First-Grade Children with Visual Perceptual Retardation.* 81 p. (Ed.D., University of California, Los Angeles, 1966) *Dissertation Abstracts,* 27, No. 1, 110-A. Order No. 66-6797, microfilm $3.00, xerography $4.40 from University Microfilms.

Investigates whether group visual perceptual training (Frostig Program—20 minutes daily for 10 weeks) can produce significant gains in reading achievement among half of 155 first graders who evidenced visual perceptual retardation, and finds significant improvement in visual perceptual skills but no significant improvement in reading achievement.

Cohen, Ruth Isenberg. "Remedial Training of First Grade Children with Visual Perceptual Retardation," *Educational Horizons,* 45 (Winter 1966-67) 60-63.

Analyzes preexperimental and post-experimental scores on several measures following a 10-week visual perceptual training course for 97 males and 58 girls who scored low on test of visual perception and reading development and who were assigned to experimental or control groups.

Coleman, James C. "Perceptual Retardation in Reading Disability Cases," *Journal of Educational Psychology,* 44 (December 1953) 497-503.

Summarizes the results of the nonverbal part of the Alpha Test of the Otis-Quick Scoring Tests given to 31 reading disability cases to determine if retardation in perceptual development is an important correlate of reading disability.

Connor, James Paul. *The Relationship of Bender-Visual-Motor Gestalt Test Performance to Differential Reading Performance of Second Grade Children.* 156 p. (Ph.D., Kent State University, 1966) *Dissertation Abstracts,* 28, No. 2, 491-A. Order No. 67-9416, microfilm $3.00, xerography $7.40 from University Microfilms.

Uses the Koppitz scoring system to clarify the relationship between perceptual motor skills and differential reading performance on 60 second-grade children matched in age, sex, and IQ but different in reading achievement (high or low), and concludes the Bender is not a highly valid instrument for accounting for differential reading performance for second-grade children.

Cooper, J. C., Jr. and **Gaeth, J. H.** "Interactions of Modality with Age and with Meaningfulness in Verbal Learning," *Journal of Educational Psychology*, 58 (February 1967) 41-44.

Investigates interactions, using 932 subjects, among five grade levels (fourth, fifth, sixth, tenth, and twelfth), two modalities (auditory versus visual), and the learning of verbal materials at two levels of meaningfulness through use of a recalled paired-associate paradigm.

Cox, Brian J. and **Hambly, Lionel R.** "Guided Development of Perceptual Skill of Visual Space as a Factor in the Achievement of Primary Grade Children," *American Journal of Optometry and Archives of American Academy of Optometry*, 38 (August 1961) 433-44.

Reports a comparative study of change in achievement quotient of two groups of grade 2 and 3 children, one of which had 24 training sessions while the other had no training.

Craig, Isabel. "Developmental Tasks in Reading," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 25-26.

Indicates that the construction and use of a diagnostic test battery can give precise information on areas of poor development in children not making expected progress in beginning reading.

Davol, Stephen H. and **Hastings, Mary Lynn.** "Effects of Sex, Age, Reading Ability, Socio-Economic Level, and Display Position on a Measure of Spatial Relations in Children," *Perceptual and Motor Skills*, 24 (April 1967) 375-87.

Measures development in spatial relations of 96 boys and 96 girls from kindergarten through grade 3 in high, middle, and low socioeconomic classes and relates results to age, sex, reading group placement, and socioeconomic level.

Dawson, David Kenneth. *An Instructional Program for Children with Perceptually Related Learning Disabilities.* 93 p. (Ph.D., The Ohio State University, 1966) *Dissertation Abstracts*, 27, No. 7, 2095-A. Order No. 66-15,079, microfilm $3.00, xerography $4.80 from University Microfilms.

Uses first- and second-grade children with average or above average mental ability, with perceptual disorganization, and who had not been successful in learning to

read in first grade in a study of the effectiveness of conventional reading instruction presented alone compared to when presented with materials and methods designed to improve basic perceptual skills.

De Hirsch, Katrina; Jansky, Jeannette J.; and Langford, W. S. *Predicting Reading Failure.* (New York: Harper and Row, 1966) 144 p.

Calculates coefficients of correlation between assessments of environmental variables, intelligence, and test of sensorimotor, linguistic, and perceptual functioning administered to a normal group of 30 boys and 23 girls at kindergarten age, and measures of their second-grade reading achievement, and compares the findings for the normal group with findings in a similar study of 53 prematurely born subjects.

Doehring, Donald G. and Rosenstein, Joseph. "Speed of Visual Perception in Deaf Children," *Journal of Speech and Hearing Research,* 12 (March 1969) 118-25.

Compares the visual perceptual speed of 50 deaf and 50 hearing children (half of whom were about 11 years old and the other half about 13 years old) equated on age, sex, and performance IQ.

Dyer, Dorothy W. and Harcum, E. Rae. "Visual Perception of Binary Patterns by Preschool Children and by School Children," *Journal of Educational Psychology,* 52 (June 1961) 161-65.

Uses nursery, kindergarten, grade 1, and grade 2 pupils to test the hypotheses that (1) prior to reading instruction, observers reveal no difference in accuracy of reproduction of meaningless elements on either side of the central fixation point, but (2) after learning to read they are more accurate in the left hemifield.

Eames, Thomas H. "The Relationship of the Central Visual Field to the Speed of Visual Perception," *American Journal of Ophthalmology,* 63 (February 1957) 279-80.

Bases conclusion on data from 50 subjects, ranging in age from 5 through 17, including measures of central fields through the use of a campimeter, and of speed of visual perception with a tachistoscope and other devices.

Edwards, Allan E. "Subliminal Tachistoscopic Perception as a Function of Threshold Method," *Journal of Psychology,* 50 (July 1960) 139-44.

Uses, compares, and evaluates three methods of testing thresholds of perception of words in terms of sensitivity to show the relativity of "subliminal" and "supraliminal" perception.

Elkind, David and Deblinger, Jo Ann. "Perceptual Training and Reading Achievement in Disadvantaged Children," *Child Development,* 40 (March 1969) 11-19.

Compares the reading achievement of 54 second-grade inner-city Negro pupils on

premeasures and post-measures of reading achievement and perceptual ability after 45 half-hour sessions with either a series of nonverbal perceptual exercises or a commercial reading program for urban disadvantaged, the Bank Street Readers.

Elkind, David; Larson, Margaret; and Van Doorninck, William. "Perceptual Decentration Learning and Performance in Slow and Average Readers," *Journal of Educational Psychology*, 56 (February 1965) 50-56.

Tests 30 slow and 30 average readers matched on age, sex, and nonverbal IQ in grades 3 through 6 for the ability to perceive hidden figures on a set of ambiguous pictures before and after they were trained to detect such figures on another similar set.

Elkind, David and Weiss, Jutta. "Studies in Perceptual Development, III--Perceptual Exploration," *Child Development*, 38 (June 1967) 553-61.

Determines perceptual patterns of exploration in 85 subjects (20 5-year-olds, 23 6-year-olds, 22 7-year-olds, and 20 8-year-olds) who were asked to name structured and unstructured arrays of familiar pictures presented to them.

Erickson, Richard C. "Visual-Haptic Aptitude: Effect on Student Achievement in Reading," *Journal of Learning Disabilities*, 2 (May 1969) 256-60.

Compares the reading achievement of seventh-grade boys who were classified primarily as visual, indeterminates, and haptic (kinaesthetic or tactile) perceivers.

Evans, James R. "Auditory and Auditory-Visual Integration Skills as They Relate to Reading," *The Reading Teacher*, 22 (April 1969) 625-29.

Cites 15 sources in discussing the relationship between auditory functions and reading.

Evvard, Evelyn. *A Comparative Study of Two Groups of Children with Reading Disability*. 99 p. (Ed.D., Arizona State University, 1964) *Dissertation Abstracts*, 25, No. 11, 6429-6430. Order No. 64-12,834, microfilm $2.75, xerography $5.00 from University Microfilms.

Compares 40 children who had not learned to read after one year of school (half emphasized the visual approach to reading—half auditory approach) with 25 successful readers, and presents results using a battery of nine tests on visual and auditory perceptual abilities and behavior traits.

Faustman, Marion N. "Some Effects of Perception Training in Kindergarten on First Grade Success in Reading," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 99-101.

Investigates the effect on first-grade reading achievement of perception training given to 14 kindergarten classes with 14 other classes as controls.

Vision—Visual Discrimination

Feldmann, Shirley. "Predicting Early Success," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 408-10.

Discusses the new Reading Prognosis Test which was designed to be predictive of future reading achievement as well as to give diagnostic information.

Feldmann, Shirley Clark. *Visual Perception Skills of Children and Their Relation to Reading.* 98 p. (Ph.D., Columbia University, 1961) *Dissertation Abstracts,* 22, No. 4, 1084-85. Order No. 61-3878, microfilm $2.75, xerography $5.00 from University Microfilms.

Studies 95 children from kindergarten through grade 5 on measures of intelligence, visual perception, and reading to determine if visual perceptual skills increase with age, to explore the relationship between visual perception skills and reading, and to determine if girls show more competence in these skills than boys.

Fenwick, James Juvenal. *Aural and Visual Instruction with Slow-Learners.* 243 p. (Ph.D., Stanford University, 1967) *Dissertation Abstracts,* 28, No. 7, 2440-A. Order No. 67-17,421, microfilm $3.15, xerography $11.05 from University Microfilms.

Investigates the hypothesized superiority of aural instruction over visual instruction and the individual study carrel over the standard group study approach using ninth-grade slow learners in experimental and control groups, and finds that slow learner subjects perform equally well in aural and visual instructional approaches and in carrel and group settings.

Ferguson, Nelda Unterkircher. *The Frostig—An Instrument for Predicting Total Academic Readiness and Reading and Arithmetical Achievement in First Grade.* 54 p. (Ph.D., The University of Oklahoma, 1967) *Dissertation Abstracts,* 28, No. 6, 2090-A. Order No. 67-15,890, microfilm $3.00, xerography $3.00 from University Microfilms.

Analyzes two matched groups of children who were separated on the basis of the Perceptual Quotient (PQ) score (above 90 and below 90) on the Frostig Test, and finds the above 90 (PQ) group performs better on the Metropolitan Readiness Test at the start of school, and performs better in reading and arithmetic achievement at the end of first grade.

Fledderjohann, William Clarence. *A Study of Some Relationships of Visual and Auditory Perception to Reading Comprehension.* 60 p. (Ed.D., University of California, Los Angeles, 1965) *Dissertation Abstracts,* 26, No. 9, 5227-28. Order No. 66-227, microfilm $3.00, xerography $3.00 from University Microfilms.

Divides selected third-grade subjects into four groups: auditory, bi-sensory, visual, or control before 4-week experimental treatments of auditory and/or visual training and concludes that transfer of skill does occur in relation to language comprehension from auditory to visual perception and from visual to auditory perception.

Ford, Marguerite P. "Auditory-Visual and Tactual-Visual Integration in Relation to Reading Ability," *"Perceptual and Motor Skills,* 24 (June 1967) 831-41.

Correlates an auditory-visual test, tactual-visual test, intelligence test, and reading achievement measures for 121 fourth-grade boys and relates the intersensory tasks to type of reading errors made on an oral diagnostic reading test.

Ford, Marguerite P. *An Exploratory Study of the Relationship of Auditory-Visual and Tactual-Visual Integration to Intelligence and Reading Achievement.* 23 p. (BR-6-8055, OEC-6-10-320, Columbia University, New York, Teachers College, January 1967) ED 010 595, microfiche $0.65, hard copy $3.29 from EDRS.

Uses a tactual-visual test, auditory-visual test, reading diagnostic test, and intelligence test on 121 white fourth-grade boys from a middle-class suburban community, and finds that auditory-visual integration skills are significantly related to intelligence and to both silent and oral reading ability, whereas tactual-visual integration skills are not.

Ford, Marguerite Prentice. *The Relationship of Auditory-Visual and Tactual-Visual Integration to Intelligence and Reading Achievement.* 114 p. (Ph.D., Columbia University, 1967) *Dissertation Abstracts,* 28, No. 2, 493-A. Order No. 67-10,581, microfilm $3.00, xerography $5.60 from University Microfilms.

Explores the relationship of intersensory tasks to intelligence and reading achievement, of the tasks to each other, and to the type of reading errors made on an oral diagnostic reading test using 121 boys in grade 4.

Fox, Henry Corbett. "The Relationship Between the Perception of Tachistoscopically Projected Images and Reading Readiness," *Studies in Education, 1952,* Thesis Abstract Series, No. 4, 117-20. (Bloomington, Indiana: School of Education, Indiana University, 1953.)

Bases conclusions on comparisons of scores made by first-grade pupils at the beginning of the year on an experimental test of the perception of tachistoscopically projected images and the scores made at the end of the year on oral- and silent-reading tests.

Frostig, Marianne. "Visual Modality, Research and Practice," *Perception and Reading,* Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 25-33.

Relates clinical experience to published research findings in discussing symptoms of reading disabilities, visual perception disabilities, laterality motor dysfunctions, and recommended instructional procedures; cites 55 references.

Frostig, Marianne; Lefever, Welty; and Whittlesey, John. "Disturbances in Visual Perception," *Journal of Educational Research,* 57 (November 1963) 160-62.

Reports the general results of a developmental test of visual perception given to 1,800 preschool and school children and 71 children with known or suspected neurological handicaps.

Fuller, Gerald B. "Perceptual Considerations in Children with a Reading Disability," *Psychology in the Schools,* 1 (July 1964) 314-17.

Tests 287 children who ranged in age from 8 to 15 and who represented four types of readers (good, primary reading disability, secondary reading disability, and organic reader) with the Minnesota Percepto-Diagnostic Test (MPD) to ascertain whether there is a perceptual difference among various types of reading disabilities.

Fuller, Gerald B. and **Ende, Russell.** "The Effectiveness of Visual Perception, Intelligence and Reading Understanding in Predicting Reading Achievement in Junior High School Children," *Journal of Educational Research,* 60 (February 1967) 280-82.

Correlates reading achievement with visual perception, intelligence, and reading for understanding for 347 junior high school students from a high socioeconomic area.

Fullwood, Harry Lee. *A Follow-Up Study of Children Selected by the Frostig Developmental Test of Visual Perception in Relation to Their Success or Failure in Reading and Arithmetic at the End of Second Grade.* 56 p. (Ph.D., The University of Oklahoma, 1968) *Dissertation Abstracts,* 29, No. 7, 2035-A. Order No. 68-17,586, microfilm $3.00, xerography $3.00 from University Microfilms

Makes a followup of Ferguson's research, carried out at the University of Oklahoma, by administering achievement tests to approximately 80 percent of the two groups utilized by Ferguson in 1966 to 1967, and finds that children who scored high in visual perception in Ferguson's study performed significantly better in reading and arithmetic than did those who had made low scores.

Geake, R. Robert. "Predictors of Reading Rate Improvement," *The Inter-Institutional Seminar in Child Development, Collected Papers, 1962,* 86-93. (Dearborn, Michigan: Edison Institute, 1963.)

Studies 60 students in grades 7 through 12, organized in four groups in terms of intelligence and initial reading rate, who were given two perceptual tests before, and a reading rate test immediately after, and 15 weeks after 15 sessions of training in rapid reading to determine the relationship of intelligence, perceptual speed, and closure to reading rate improvement.

Gilbert, Luther C. "Influence of Interfering Stimuli on Perception of Meaningful Material," *California Journal of Educational Research,* 50 (January 1959) 15-23.

Summarizes data secured from 68 upper division and graduate students "to determine the amount of interference which resulted when a competing stimulus

was thrown on the same group of rods and cones immediately following or preceding the presentation of words or phrases of sense material."

Goetzinger, C. P. S.; Dirks, D. D. S.; and Baer, C. J. "Auditory Discrimination and Visual Perception in Good and Poor Readers," *Annals of Otology, Rhinology, and Laryngology*, 69 (March 1960) 121-36.

Compares 15 good with 15 poor readers, ages 10 to 12 years, equated for Binet IQ's and sex, on three tests of auditory discrimination, the Raven Progressive Matrices, and two tests of visual discrimination.

Goins, Jean Turner. *Visual Perceptual Abilities and Early Reading Progress.* Supplementary Educational Monographs, No. 87. (Chicago: University of Chicago Press, February 1958) 108 p.

Presents and analyzes data secured "(1) to ascertain the level of competence in visual perception of first-grade children and the correlation of their perceptual abilities with their achievement in reading and (2) to determine the effect that training in recognition of visual forms would have on progress in learning to read."

Goldmark, Bernice. *The Relation of Visual Perception, Auditory Perception and One Aspect of Conceptualization of Word Recognition.* 153 p. (Ed.D., University of Arizona, 1964) *Dissertation Abstracts,* 25, No. 1, 186. Order No. 64-6227, microfilm $2.75, xerography $7.20 from University Microfilms.

Explores whether auditory perception has a significantly higher positive correlation with word recognition than does visual perception, and whether categorization, one aspect of conceptualization, has a significant positive correlation with word recognition when using 83 second-grade children.

Gorelick, Molly C. "The Effectiveness of Visual Form Training in a Prereading Program," *Journal of Educational Research,* 58 (March 1965) 315-18.

Investigates two different visual discrimination approaches to word recognition success in two experimental groups of 23 first graders each and a control group.

Gredler, Gilbert R. "Performance on a Perceptual Test with Children from a Culturally Disadvantaged Background," *Perception and Reading,* Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 86-91.

Investigates the relationship between teacher rating of adjustment, achievement, and scores on the Minnesota Percepto-Diagnostic Test at third and fourth grades; results were contrasted with the performance of 15 clinic students of similar age and intelligence.

Hagin, Rosa A.; Silver, Archie A.; and Hersh, Marilyn F. "Specific Reading

Disability, Teaching by Stimulation of Deficit Perceptual Areas," *Reading and Inquiry*, J. Allen Figurel, Ed. Proceedings of the International Reading Association, 10 (1965) 368-70.

Compares pretest and post-test scores on a battery of perceptual and reading tests for 40 boys, ages 8 to 11 years, with reading problems and who had been paired on several variables and assigned to either an experimental group receiving 6 months of training in perceptual stimulation or a control group receiving conventional reading instruction during the same period.

Halpern, Esther. "Reading Success by Children with Visual-Perceptual Immaturity: Explorations Within Piaget's Theory," *American Journal of Orthopsychiatry*, 40 (March 1970) 311-12.

Deals with the cognitive compensating mechanisms of 35 second-grade children, performing below intellectual and age level expectations on two visual-perceptual tasks, in the execution of three Piagetian tasks (conservation, transivity of weight, and reliance/independence) and finds that success in reading can be predicted, for this group, at the .05 level.

Hamilton, George E. and **Anderson, Paul L.** "Will Perceptual Training Alone Increase Reading Ability of Adults?" *The Reading Teachers' Mailbox*, No. 10, 4-7. (Meadville, Pennsylvania: Keystone View Company, October 1, 1956.)

Bases conclusions on the results of 26 one-half hour periods of group training through the use of the Keystone Tachistoscope and the accompanying "tachisto-slides" given to 13 stenographic and clerical women employees at the Keystone Company.

Harcum, E. Rae. "Visual Hemifield Differences as Conflicts in Direction of Reading," *Journal of Experimental Psychology*, 72 (September 1966) 479-80.

Investigates right-left hemifield differences for 18 subjects who observed 120 eight-letter English words, equally distributed randomly to left or right sides of fixation under one of four orientation-sequence conditions.

Harcum, E. Rae and **Dyer, Dorothy W.** "Monocular and Binocular Reproduction of Binary Stimuli Appearing Right and Left of Fixation," *American Journal of Psychology*, 75 (March 1962) 56-65.

Compares the relative accuracy of reproducing visual patterns appearing at both left and right of the fixation point with 12 college students using a tachistoscope.

Harcum, E. Rae and **Friedman, Stephen M.** "Reversal Reading by Israeli Observers of Visual Patterns Without Intrinsic Directionality," *Canadian Journal of Psychology*, 17 (December 1963) 361-69.

Investigates 10 Hebrew-speaking Israeli students to determine if they would tend to

use right-left sequence by asking them to reproduce, under three conditions, some patterns exposed to them tachistoscopically.

Harcum, E. Rae and Smith, Nelson F. "Effect of Pre-Known Stimulus-Reversals on Apparent Cerebral Dominance in Word Recognition," *Perceptual and Motor Skills*, 17 (December 1963) 799-810.

Makes an investigation of the phenomenon whereby the relative accuracy between hemifields in reproducing tachistoscopically exposed words was affected by reversing the orientation and sequence of the letters.

Harrington, Sister Mary James and Durrell, Donald D. "Mental Maturity Versus Perception Abilities in Primary Reading," *Journal of Educational Psychology*, 46 (October 1955) 375-80.

Presents a summary and analysis of data secured from 1,500 second-grade pupils to determine the influence of each of the following factors on reading achievement: visual discrimination, auditory discrimination, phonics, and mental ability.

Hartung, Joseph Edward. *Visual Perceptual Skills, Reading Ability and the Young Deaf Child.* 82 p. (Ph.D., Washington University, 1968) *Dissertation Abstracts*, 29, No. 12, 4184-A. Order No. 69-8998, microfilm $3.00, xerography $4.40 from University Microfilms.

Investigates 30 orally trained deaf children and 30 children with normal hearing from 7 years 5 months to 9 years to determine whether knowledge of code or normal visual perception skills can be the underlying cause of reading deficiency, and finds an indication of similar perceptional ability but dissimilar recall of alphabetic material or code in favor of the normal hearing group.

Hartung, Joseph E. "Visual Perceptual Skills, Reading Ability, and the Young Deaf Child," *Exceptional Children*, 36 (April 1970) 603-08.

Evaluates the visual perceptual skills of beginning readers with normal intelligence using 30 deaf and 30 normally hearing children who were matched in chronological age, with the range being between 7.5 and 9 years.

Hershenson, Maurice. *The Role of Stimulus Structure in the Perception of Briefly Exposed Visual Stimuli.* Final Report. 31 p. (PROJ-3293, BR-5-0603, OEC-6-10-286, Wisconsin University, Madison, March 1968) ED 021 700, microfiche $0.65, hard copy $3.29 from EDRS.

Investigates the effect of redundancy (structure) in written language on visual perception using unfamiliar seven-letter arrays differing in percentage of redundancy repeatedly exposed for brief durations, and finds letter position to be the overriding determiner of perceptibility, yielding an inverted U-shaped function about the fixation point.

Vision—Visual Discrimination

Hill, Suzanne D. and Hecker, Elynordel E. "Auditory and Visual Learning of a Paired-Associate Task by Second Grade Children," *Perceptual and Motor Skills*, 23 (December 1966) 814.

Explores efficiency of paired-associate learning in visual versus auditory presentation conditions for 32 second graders who were presented, in each modality, 32 word pairs selected from preprimers.

Hurd, Donald E. *A Study of the Relationship Between Reading Achievement and Sense Modality Shifting.* 25 p. (BR-6-8688, OEC-3-7-068688-0112, 1967) ED 015 119, microfiche $0.65, hard copy $3.29 from EDRS.

Examines the relationship between visual and auditory singular modal responses and modal shifting behavior to reading achievement using 120 second, fourth, and sixth graders from Peoria, Illinois, public schools by obtaining measures of auditory and visual reaction times, visual-auditory shifting and singular modal auditory and visual response, intelligence, socioeconomic status, and reading achievement.

Jacobs, James N. "An Evaluation of the Frostig Visual-Perceptual Training Program," *Educational Leadership*, 25 (January 1968) 332-40.

Analyzes the effect of training with the Frostig program on performance on the Frostig test and on reading readiness for two prekindergarten, two kindergarten, and two first-grade classes.

Jacobs, James N.; Wirthlin, Lenore D.; and Miller, Charles B. "A Follow-Up Evaluation of the Frostig Visual-Perceptual Training Program," *Educational Leadership*, 26 (November 1968) 169-75.

Attempts to answer questions related to the predictive validity of a visual-perceptual test and the cumulative effect of the Frostig program on reading achievement by evaluating the over 300 prekindergarten, kindergarten, and first- and second-grade children in the study.

Jester, Robert E. "Comments on Hsia's Auditory, Visual, and Audiovisual Information Processing," *Journal of Communication*, 18 (December 1968) 346-49.

Measures comprehension of three forms of a reading test given to subjects at varying rates in an auditory, visual, and audiovisual presentation and establishes relationships within and between presentation conditions.

Jester, Robert E. and Travers, Robert M. W. "Comprehension of Connected Meaningful Discourse as a Function of Rate and Mode of Presentation," *Journal of Educational Research*, 59 (March 1966) 297-302.

Compares the comprehension of 15 groups totaling 220 college students to eight

passages administered to each group at either one of five speeds through either the visual, the auditory, or the audiovisual modality of presentation.

Justison, Gertrude G. *Visual Perception of Form and School Achievement (An Exploratory Study of the Relationship Between Form Perception and School Achievement Among Third Grade Pupils in the Public Schools of Montgomery County, Maryland).* 118 p. (Ed.D., University of Maryland, 1960) *Dissertation Abstracts,* 22, No. 6, 1907-08. Order No. 61-4907, microfilm $2.75, xerography $5.80 from University Microfilms.

Uses a stratified random sample of 398 third graders to demonstrate a range of individual differences in reading and related school performance in order to show the integration of visual perception with the total performance in the symbolic tasks of the school curriculum.

Kahn, Dale and **Birch, Herbert G.** "Development of Auditory-Visual Integration and Reading Achievement," *Perceptual and Motor Skills,* 27 (October 1968) 459-68.

Studies the interrelationships among auditory-visual integrative competence, IQ, and type of reading task for 350 boys in grades 2 through 6.

Katz, Phyllis A. "Verbal Discrimination Performance of Disadvantaged Children: Stimulus and Subject Variables," *Child Development,* 38 (March 1967) 233-42.

Compares discrimination performance on visual and auditory tasks presented in both Hebrew and English to 72 Negro males of differing reading achievement levels in grades 2, 4, and 6.

Katz, Phyllis A. and **Deutsch, Martin.** "Modality of Stimulus Presentation in Serial Learning for Retarded and Normal Readers," *Perceptual and Motor Skills,* 19 (October 1964) 627-33.

Uses a sample of 48 Negro boys in first, third, and fifth grades to explore auditory and visual learning efficiency and its relationship to both age and reading proficiency.

Katz, Phyllis A. and **Deutsch, Martin.** *Visual and Auditory Efficiency and Its Relationship to Reading in Children.* 80 p. (CRP-1099, New York Medical College, 1963) ED 003 042, microfiche $0.65, hard copy $3.29 from EDRS.

Explores the relationships between auditory and visual functioning and reading achievement, and investigates the influence of developmental factors on these variables using poor and normal readers in three different grade levels (first, third, and fifth), and finds an indication that reading may be adversely affected by any one of the psychological processes of discrimination, memory, learning, and conception.

Vision—Visual Discrimination

Kerfoot, James Fletcher. *The Relationship of Selected Auditory and Visual Reading Readiness Measures to First Grade Reading Achievement and Second Grade Reading and Spelling Achievement.* 305 p. (Ph.D., University of Minnesota, 1964) *Dissertation Abstracts,* 25, No. 3, 1747-48. Order No. 64-9492, microfilm $4.95, xerography $13.75 from University Microfilms.

Investigates five hypotheses using a stratified random sample of 462 children (239 boys and 223 girls) and an extensive battery of tests; lists findings.

King, Ethel M. "Effects of Different Kinds of Visual Discrimination Training on Learning to Read Words," *Journal of Educational Psychology,* 55 (December 1964) 325-33.

Compares learning performances of six groups (23 each) of kindergarten pupils in ability to recognize four words following different types of stimuli and methods of presentation of visual discrimination tasks.

King, Ethel M. "Learning to Read Words: An Experiment in Visual Discrimination," *Reading and Inquiry,* J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 337-40.

Presents a research study on determining the effects of visual discrimination training with different types of stimulus materials and different methods of stimulus presentation.

Kremenak, Shirley White. *An Investigation of the Relationships Among Reading Achievement, Reading Readiness and the Ability to Match Within and Between the Visual and Auditory Sensory Modalities.* 148 p. (Ph.D., The University of Iowa, 1965) *Dissertation Abstracts,* 26, No. 10, 5870. Order No. 66-3453, microfilm $3.00, xerography $7.00 from University Microfilms.

Studies 108 first-grade children on their ability to make the following associations: visual to visual (V-V), visual to auditory (V-A), auditory to visual (A-V), and auditory to auditory (A-A) as they relate to reading.

LaPray, Margaret and Ross, Ramon. *Comparison of Two Procedures for Teaching Reading to Primary Children with Visual Perception Difficulties.* 33 p. (CRP-S-138, San Diego State College, California, 1965) ED 003 695, microfiche $0.65, hard copy $3.29 from EDRS.

Compares the reading abilities of first and second graders from low socioeconomic groups who had visual perception problems and who were taught by conventional methods with those children given special training designed to improve faulty or immature visual perception, and finds no evidence that children who receive the special training make better gains in reading or do not make better gains.

LaPray, Margaret Helen and Ross, Ramon. "Auditory and Visual Perceptual

Training," *Vistas in Reading*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 11, Part 1 (1966) 530-32.

Offers background and three suggestions for teachers wishing to do a better job in developing reading readiness.

Lay, Margaret Zoe. *The Relationship of Selected Perceptual and Cognitive Variables to Word Recognition Learning.* 77 p. (Ed.D., The University of Florida, 1967) *Dissertation Abstracts*, 29, No. 1, 149-50-A. Order No. 68-9535, microfilm $3.00, xerography $4.20 from University Microfilms.

Investigates by means of an experimental learning task Piaget's formulations of development, utilizing visual discrimination-retention, and conservation as predictors for aspects of word recognition, and finds visual discrimination to be the superior predictor.

Leider, Alice B. "Relationship of Visual Perception to Word Discrimination," *Clinical Studies in Reading III*, Helen M. Robinson and Helen K. Smith, Eds. Supplementary Educational Monographs, 97 (1968) 104-08.

Calculates intercorrelation coefficients to determine relationship among scores on three tests of visual perception, two forms of a word discrimination test, an achievement and an intelligence test, given to 70 pupils in grade 4.

Lemmon, Robert Allen. *Visual Perceptual Characteristics of Groups of Educable Mental Retardates.* 141 p. (Ed.D., Colorado State College, 1967) *Dissertation Abstracts*, 28, No. 8, 2901-A. Order No. 68-435, microfilm $3.00, xerography $6.80 from University Microfilms.

Explores the characteristics of visual perception, chronological age, and intelligence of 60 cultural familial mental retardates using two visual perception tests and finds that the children: (1) have the ability to develop adequate closure competencies, (2) do not learn skills of visual closure through experiences of maturing, and (3) increase their visual identification and discrimination skills through common experiences.

Leton, Donald A. and Dayton, Glenn O., Jr. "Relationship of Critical Flicker-Fusion Thresholds to Reading Readiness in Six-Year-Old Children," *Perceptual and Motor Skills*, 18 (February 1964) 175-81.

Determines coefficients of correlation between scores on critical flicker-fusion tests and scores on reading readiness, achievement, intelligence, and other measures for 40 boys and girls divided into a high and a low reading readiness group.

Lloyd, Bruce A. "The Relationship Between Visual-Tactual Training and Children's Reading Achievement and Mental Maturity, A Small Sample Study," *Journal of the Reading Specialist*, 3 (March 1966) 108-12.

Vision—Visual Discrimination

Investigates relationships between pretraining and post-training scores on measures of visual-tactual ability, mental maturity, and reading achievement for 10 reading clinic clients, aged 9 to 15, who received perceptual training and remedial reading during 17 weeks.

Lockhard, Joan and Sidowski, Joseph B. "Learning in Fourth and Sixth Graders as a Function of Sensory Mode of Stimulus Presentation and Overt or Covert Practice," *Journal of Educational Psychology*, 52 (October 1961) 262-65.

Seeks to determine the influence of three modes of presentation (auditory, visual, and auditory-visual) and two modes of responding (overt and covert) on 18 grade 4 and 18 grade 6 pupils who learned lists of nonsense syllables.

Lyle, J. G. and Goyen, Judith. "Visual Recognition, Developmental Lag, and Strephosymbolia in Reading Retardation," *Journal of Abnormal Psychology*, 73 (February 1968) 25-29.

Presents three sets of tachistoscopically projected stimuli (letters of alphabet, lines, and word shapes) under three conditions of visual recognition to 20 retarded and 20 adequate readers (32 boys and eight girls) all of whom were in the normal range of intelligence.

Marchbanks, Gabrielle and Levin, Harry. "Cues by Which Children Recognize Words," *Journal of Educational Psychology*, 56 (April 1965) 57-61.

Attempts to discover the cues by which children recognize three- and five-letter words by studying 50 kindergarten and 50 first-grade children who were required to select from a group of pseudo-words, the one similar to a word that had just been exposed to them.

Mason, Geoffrey P. "Word Discrimination and Spelling," *Journal of Educational Research*, 50 (April 1957) 617-21.

Compares the progress during an 11-week period of an experimental group of 107 pupils in four sixth-grade classes who practiced on a varied schedule beginning with 10 minutes daily on exercises in discriminating "between similar groups of letters" and a control group of 97 pupils in three sixth-grade classes of nearby schools.

McAninch, Myrene. "Identification of Visual Perceptual Errors in Young Children," *Vistas in Reading*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 11, Part 1 (1966) 507-12.

Questions whether or not current testing instruments reliably measure skills relevant to the reading process.

McBeath, Pearl Marcia Loebenstein. *The Effectiveness of Three Reading Preparedness Programs for Perceptually Handicapped Kindergarteners.* 144 p. (Ph.D.,

Stanford University, 1966) *Dissertation Abstracts*, 27, No. 1, 115-A. Order No. 66-6365, microfilm $3.00, xerography $6.80 from University Microfilms.

Studies the relationship between classroom adjustment and perceptual ability using 24 kindergarten classes randomly assigned into four groups following four different programs and finds that none of the programs provided significantly superior results in developing reading readiness skills.

McClanahan, Lloyd James. *The Effectiveness of Perceptual Training for Slow Learners.* 129 p. (Ed.D., Stanford University, 1967) *Dissertation Abstracts*, 28, No. 7, 2560-A. Order No. 67-17,543, microfilm $3.00, xerography $6.20 from University Microfilms.

Explores the effects of 35 hours of perceptual training on the mental maturity, perceptual skills, and reading performance of 92 slow learning first-grade children and 23 children enrolled in classes for the Educable Mentally Retarded (EMR) using pretests and post-tests in perception, reading, and mental maturity with a 35-lesson training program for the experimental groups.

McLeod, James March. *An Investigation of the Frostig Program in Teaching Children with Extreme Learning Problems.* 379 p. (Ed.D., University of Oregon, 1966) *Dissertation Abstracts*, 28, No. 4, 1303-A. Order No. 67-10,786, microfilm $4.85, xerography $17.10 from University Microfilms.

Compares two groups of seven children, each with extreme learning problems and difficulties in visual perception, giving the experimental group the Frostig Program, the Gillingham method of teaching, selections of Kephart's program, physical education, music, arithmetic, and art; while the contrast group received the Marianne Frostig Development Test of Visual Perception seven times in addition to pretests and post-tests in reading and arithmetic.

McLeod, John. "Some Psycholinguistic Correlates of Reading Disability in Young Children," *Reading Research Quarterly*, 2 (Spring 1967) 5-31.

Compares disabled readers' ability to reproduce tachistoscopically presented letter sequences and to discriminate and vocally reproduce auditorially presented words in three experiments carried out with 46 second-grade boys and girls divided into an experimental and a control group.

Mertens, Marjorie K. *A Visual Perception Test for the Prediction and Diagnosis of Reading Ability.* 124 p. (Ed.D., University of Arizona, 1968) *Dissertation Abstracts*, 29, No. 4, 1133-A. Order No. 68-13,671, microfilm $3.00, xerography $6.00 from University Microfilms.

Reports the development of a visual perception test which incorporates seven subtests designed to identify those first-grade children who might develop reading disabilities because of some visual perceptual deficit.

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Mould, Richard Edward. *An Evaluation of the Effectiveness of a Special Program for Retarded Readers Manifesting Disturbed Visual Perception.* 90 p. (Ed.D., Washington State University, 1965) *Dissertation Abstracts,* 26, No. 1, 228. Order No. 65-7706, microfilm $3.00, xerography $4.80 from University Microfilms.

Investigates the Frostig Program for the Development of Visual Perception using 42 children (21 matched pairs in control and experimental groups) who manifested visual perceptual distortions.

Muehl, Siegmar. "The Effects of Visual Discrimination Pretraining on Learning to Read a Vocabulary List in Kindergarten Children," *Journal of Educational Psychology,* 51 (August 1960) 217-21.

Reports an experiment which "compared the performance of three groups of kindergarten children in learning to read a vocabulary test"; the groups differed in the type of visual discrimination pretraining given before the learning task and the stimuli for each group were the same words that appeared in the vocabulary list, different words, and geometric forms.

Muehl, Siegmar. "The Effects of Visual Discrimination Pretraining with Word and Letter Stimuli on Learning to Read a Word List in Kindergarten Children," *Journal of Educational Psychology,* 52 (August 1961) 215-21.

Compares transfer to the reading task from pretraining in discrimination with words among three groups of children who received pretraining in which: (1) both shape and letter differences were relevant to the final task, (2) only letter differences were pertinent, and (3) relevant letters only were pertinent.

Muehl, Siegmar and King, Ethel M. "Recent Research in Visual Discrimination—Significance for Beginning Reading," *Vistas in Reading,* J. A. Figurel, Ed. International Reading Association Conference Proceedings, 11, Part 1 (1966) 434-39.

Reviews research concerning how children discriminate visually among words and suggests some implications for teaching; cites 15 sources.

O'Connor, William J. "The Relationship Between the Bender-Gestalt Test and the Marianne Frostig Developmental Test of Visual Perception," *Reading Disability and Perception,* G. D. Spache, Ed. International Reading Association Conference Proceedings, 13 (1969) 72-81.

Explores the relationship between tests of visual-motor perception, intelligence, and reading readiness, in terms of age, sex, intelligence, and socioeconomic status using 89 first- and second-grade children from middle and lower socioeconomic class levels.

Olson, Arthur V. "Cues in Word Perception in Relation to Osgood's Integration

Principle," *Reading Disability and Perception*, G. D. Spache, Ed. International Reading Association Conference Proceedings, 13 (1969) 112-18.

Studies the effect of reducing stimulus cue input by means of tachistoscopic presentation (speeds of 1/10, 1/25, 1/50, and 1/100 seconds) on the word perception of 140 first-grade children, and finds that the accuracy of recognition decreases significantly as the speed of exposure increases.

Olson, Arthur V. "The Frostig Developmental Test of Visual Perception as a Predictor of Specific Reading Abilities with Second-Grade Children," *Elementary English*, 43 (December 1966) 869-72.

Presents an intercorrelation matrix indicating relationships among subtest and total scores on the Frostig instrument and nine measures, six of which were designed to reveal reading difficulty, for 29 girls and 42 boys in second grade.

Olson, Arthur V. "Relation of Achievement Test Scores and Specific Reading Abilities to the Frostig Developmental Test of Visual Perception," *Perceptual and Motor Skills*, 22 (February 1966) 179-84.

Reports the correlations between the scores of 71 second-grade children on the Frostig Test of Visual Perception and a battery of tests measuring intelligence, achievement, and specific reading abilities.

Olson, Arthur V. "School Achievement, Reading Ability, and Specific Visual Perception Skills in the Third Grade," *The Reading Teacher*, 19 (April 1966) 490-92.

Correlates the scores of 121 third-grade pupils on a battery of reading and achievement tests with their scores on the Frostig Developmental Test of Visual Perception.

Olson, Jack R. "A Factor Analytic Study of the Relation Between the Speed of Visual Perception and the Language Abilities of Deaf Adolescents," *Journal of Speech and Hearing*, 10 (June 1967) 354-60.

Correlates five visual perceptual tests and three language measures for 20 male and 19 female deaf subjects, ages 12 to 16 years, and factor-analyzes the resulting data.

Otto, Wayne. "Ability of Poor Readers to Discriminate Paired Associates Under Differing Conditions of Confirmation," *Journal of Educational Research*, 56 (April 1963) 428-31.

Makes an evaluation of the difficulty of 30 poor readers from grades 4 to 7, 10 being assigned to each of three modes of reinforcement (visual, auditory, and kinaesthetic), in learning a list of paired associates (geometric forms and nonsense syllables) and explores reasons for ease or difficulty of association.

Otto, Wayne. "The Acquisition and Retention of Paired Associates by Good, Average, and Poor Readers," *Journal of Educational Psychology*, 52 (October 1961) 241-48.

Makes an evaluation of the effects of three levels of reading achievement (good, average, and poor) with three levels of grade placement (2, 4, and 6) and three modes of reinforcement (visual, auditory, and kinaesthetic) on learning a list of paired associates, consisting of geometric forms and nonsense syllables, as well as on retention and relearning after 24 hours.

Overton, Willis and Wiener, Morton. "Visual Field Position and Word Recognition Threshold," *Journal of Experimental Psychology*, 71 (February 1966) 249-53.

Studies 16 college students having 20/20 vision to investigate right versus left field recognition behavior by use of monocular viewing condition for 20 5-letter words at two distances from fixation.

Pimsleur, Paul and Bonkowski, Robert J. "Transfer of Verbal Material Across Sense Modalities," *Journal of Educational Psychology*, 52 (April 1961) 104-07.

Presents, randomly, 10 paired associates (dissyllables and colors), first through one modality then another, to 28 college students, half of whom had received A or B and the other half C or D grades in Spanish 1 to determine the most effective order for learning.

Polenz, Ralph J. *An Analysis of the Performance of Second Grade Boys with Visual Perceptual Deficiencies and Second Grade Boys with Satisfactory Visual Perception on the Gray Oral Reading Test.* 128 p. (Ed.D., University of South Dakota, 1968) *Dissertation Abstracts*, 29, No. 8, 2447-A. Order No. 69-3127, microfilm $3.00, xerography $6.20 from University Microfilms.

Studies the number and types of reading errors made by second-grade boys in order to determine the influence of varying levels of visual perception on reading using the Frostig Test, Peabody Picture Vocabulary Test, and Gray Oral Reading Test, and finds that reading errors were significantly higher in children with visual perception deficiencies than in children with satisfactory perceptual abilities.

Popp, Helen M. "The Measurement and Training of Visual Discrimination Skills Prior to Reading Instruction," *Journal of Experimental Education*, 35, (Spring 1967) 15-26.

Investigates effects of test-specific discrimination training with 127 beginning first graders who were pretested for visual discrimination of bigrams and trigrams and assigned either to the experimental group which received test-specific discrimination training or to the control group which received nontest specific discrimination training.

Popp, Helen M. "Visual Discrimination of Alphabet Letters," *The Reading Teacher*, 17 (January 1964) 221-26.

Establishes the relative difficulty of the visual discrimination of letters by presenting, by means of a modified slide projector, to 65 kindergarten children (aged 5.1 to 6.1) two alternative alphabet letter stimuli to match with a sample letter.

Potter, Muriel Catherine. *Perception of Symbol Orientation and Early Reading Success.* Contributions to Education No. 939. (New York: Bureau of Publications, Teachers College, Columbia University, 1949) 69 p.

Analyzes the results of tests given to 176 first-grade children to determine the extent of occurrence among them of "errors in visual perception which have been found characteristic of children who fail to progress at the expected rate in the acquisition of reading skill."

Reynolds, Richard J.; Palmatier, Robert A.; and Ulmer, Curtis. "Effect of Mode of Input on Ideational Fluency in Adult Literacy Training Groups," *Journal of Reading Behavior*, 1 (Spring 1969) 53-63.

Presents 20 stimulus words in seven different modes to 140 deprived adult male and female Negroes.

Richardson, J. "A Factorial Analysis of Reading Ability in 10-Year-Old Primary School Children," *British Journal of Educational Psychology*, 20 (November 1950) 200-01.

Summarizes briefly the results of a factorial analysis based on the responses of 260 children to a battery of 21 tests (reading, language, visual and auditory discrimination) and "assessments of experimental background and of attitude to reading."

Roberts, Richard W. and Coleman, James C. "An Investigation of the Role of Visual and Kinesthetic Factors in Reading Failure," *Journal of Educational Research*, 51 (February 1958) 445-51.

Presents the results of a controlled experiment involving 27 boys in the experimental group which varied in age from 9.3 to 14.0 to test three hypothesis underlying the use of kinesthetic methods in remedial reading cases.

Robertson, Jean E. "Kindergarten Perception Training: Its Effect on First Grade Reading," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 93-99.

Cites 15 references used as the bases for perception training suggestions for kindergarten and first grade.

Robinson, H. Alan. "Reliability of Measures Related to Reading Success of Average, Disadvantaged, and Advantaged Kindergarten Children," *The Reading Teacher*, 20 (December 1966) 203-09.

Investigates reliability of eight instruments designed to identify visual, auditory, or visuo-motor abilities, or to assess reading readiness or general intelligence.

Robinson, Helen M. "Perceptual and Conceptual Style Related to Reading," *Improvement of Reading Through Classroom Practice*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 9 (1964) 26-28.

Considers a number of studies investigating visual perception on primary level through college level.

Robinson, Helen M., *et al.* "Children's Perceptual Achievement Forms: A Three Year Study," *American Journal of Optometry and Archives of American Academy of Optometry*, 37 (May 1960) 223-37.

Reports the results of a study to determine the value of the Children's Perceptual Achievement Forms as a predictor of reading achievement, using scores on various tests given to those of 87 first-grade pupils in 1956-57 who remained in school for the 3 years.

Rosen, Carl L. "An Experimental Study of Visual Perceptual Training and Reading Achievement in First Grade," *Perceptual and Motor Skills*, 22 (June 1966) 979-86..

Relates scores on reading readiness, visual perception, and intelligence measures to post-instructional reading achievement scores of 637 pupils in 25 first-grade classrooms, 12 of which received visual perceptual training during scheduled reading periods for 29 days.

Rosen, Carl L. and Ohnmacht, F. "Perception, Readiness, and Reading Achievement in First Grade," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 33-39.

Uses factor analysis procedures in analyzing separately by sex scores on readiness, perception, and reading achievement subtests administered to 324 boys and 313 girls.

Rosen, Carl Lyle. *A Study of Visual Perception Capabilities of First Grade Pupils and the Relationship Between Visual Perception Training and Reading Achievement*, 382 p. (Ph.D., University of Minnesota, 1965) *Dissertation Abstracts*, 26, No. 9, 5247-48. Order No. 65-287, microfilm $4.90, xerography $17.35 from University Microfilms.

Studies the effects of a visual perception training program using an adaptation of the Frostig Visual Perception Training Program upon growth in perceptual

capabilities and reading achievement on 324 boys and 313 girls in 25 first-grade classes in eight Minneapolis, Minnesota, elementary schools.

Rosenfield, Sylvia Schulman. *The Effect of Perceptual Style on Word Discrimination Ability of Kindergarten Children.* 103 p. (Ph.D., The University of Wisconsin, 1967) *Dissertation Abstracts,* 28, No. 12, 4914-A. Order No. 67-17,007, microfilm $3.00, xerography $5.20 from University Microfilms.

Studies the usefulness of analytic perceptual style as a predictor of visual discrimination level using 60 kindergarten children divided into analytic and nonanalytic groups of boys and girls of which one-half of each group received discrimination training.

Rouch, Roger Lewis. *The Relationship of Certain Selected Factors of Visual Discrimination to Performance in Beginning Reading.* 139 p. (Ed.D., Ball State University, 1967) *Dissertation Abstracts,* 29, No. 1, 73-74-A. Order No. 68-3244, microfilm $3.00, xerography $6.60 from University Microfilms.

Surveys the following measurable visual discrimination tasks: matching word forms, matching geometric forms, letter disrimination, distinguishing between figure and background in order to ascertain their relation to performance in beginning reading using a sample population of 203 first-grade pupils who were analyzed by sex, IQ, and reading achievement.

Rudnick, Mark; Sterritt, Graham, M.; and Flax, Morton. "Auditory and Visual Rhythm Perception and Reading Ability," *Child Development,* 38 (June 1967) 581-87.

Correlates three perceptual tests (auditory, visual, and visual-auditory) with measures of intelligence and reading achievement for 36 third-grade boys of middle class background.

Russell, David H. and Groff, Patri. "Personal Factors Influencing Perception in Reading," *Education,* 75 (May 1955) 600-03.

Reviews the results of a series of studies which support the view that the child's perception in reading "is affected by many factors other than the visual, auditory or kinaesthetic methods in which he is trained by the teacher."

Russell, Kenneth Stevenson. *The Relationships of Phonetic Skill, Rote Memory, Verbal Achievement and Visual Memory to Spelling Achievement as Measured by Three Different Formats.* 76 p. (Ed.D., University of Idaho, 1968) *Dissertation Abstracts,* 29, No. 6, 1794-A. Order No. 16-17,002, microfilm $3.00, xerography $4.20 from University Microfilms.

Measures spelling achievement by way of multiple choice, oral, and written formats

using 133 high school seniors, and finds a relationship for both phonetic skill and rote memory to spelling but no significant correlation for visual memory to spelling.

Rutherford, William L. "Vision and Perception in the Reading Process," *Vistas in Reading*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 11, Part 1 (1966) 503-07.

Recognizes vision and perception as vital factors in the reading process.

Rystrom, Richard. "Evaluating Letter Discrimination Problems in the Primary Grades," *Journal of Reading Behavior*, 1 (Fall 1969) 38-48.

Develops a behavioral definition of letter recognition, presents a test for measuring the extent to which children can recognize letters, and reports data for 93 kindergarteners through third graders using the test.

Santoro, Roseann Marie. *The Relationship of Reading Achievement to Specific Measures of Visual Perception, Visual-Motor Perception, and Intelligence.* 141 p. (Ph.D., Fordham University, 1967) *Dissertation Abstracts*, 28, No. 10, 4010-A. Order No. 68-3720, microfilm $3.00, xerography $6.80 from University Microfilms.

Uses 100 first-, second-, third-, and fourth-grade girls and after administering a battery of tests finds that the variables of intelligence and visual perception are important to reading achievement at the first- and second-grade levels; no variables are significantly correlated with reading achievement at the third-grade level; and intelligence is highly correlated with reading achievement at the fourth-grade level.

Scott, Ralph. "Perceptual Readiness as a Predictor of Success in Reading," *The Reading Teacher*, 22 (October 1968) 36-39.

Reports the results of a followup evaluation of 173 kindergarten children's scores on an experimental seriation test and their second-grade reading attainments.

Seitz, Robert, Jr. *An Examination of Visual Perceptual Performances by Retardates and Normals on Embedded Figures and Structural Analysis in Reading.* 172 p. (Ed.D., Indiana University, 1964) *Dissertation Abstracts*, 25, No. 10, 5750-51. Order No. 65-2393, microfilm $2.75, xerography $8.00 from University Microfilms.

Analyzes and compares the performance of 24 educable retarded adolescents and 24 intellectually normal adolescents on an Embedded Figures Test and a Structural Analysis Test.

Shea, Carol Ann. *Visual Discrimination of Words as a Predictor of Reading Readiness*, 180 p. (Ph.D., The University of Connecticut, 1964) *Dissertation Abstracts*, 25, No. 11, 6321. Order No. 65-2743, microfilm $2.75, xerography $8.20 from University Microfilms.

Presents relationships and conclusions derived from an examination using 76 first graders in a study of predictors of reading achievement.

Shea, Carol Ann. "Visual Discrimination of Words and Reading Readiness," *The Reading Teacher,* 21 (January 1968) 361-67.

Develops a Test of Visual Discrimination of Words using 134 kindergarten children and then uses this test and two other tests as predictors of reading achievement at midyear in first grade for 34 boys and 42 girls.

Silvaroli, Nicholas J. "Factors in Predicting Children's Success in First Grade Reading," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 296-98.

Indicates that identification of upper and lower case letters can be used to predict probably success in first-grade reading.

Silvaroli, Nicholas Joseph. *Intellectual and Emotional Factors as Predictors of Children's Success in First Grade Reading.* 121 p. (Ed.D., Syracuse University, 1963) *Dissertation Abstracts,* 24, No. 12, 5098. Order No. 64-5673, microfilm $2.75, xerography $6.00 from University Microfilms.

Uses 600 public kindergarten children to determine whether any combination of the factors of mental age, auditory discrimination, visual discrimination, letter identification, social class status, and maternal n-achievement could be used prior to formal reading instruction to predict probable reading success and singles out the letter identification factor as one of the best predictors.

Silver, Archie A. and Hagin, Rosa A. "Maturation of Perceptual Functions in Children with Specific Reading Disability," *The Reading Teacher,* 19 (January 1966) 253-59.

Compares, for 18 adult subjects, 10 of whom were classified as cases of developmental reading disability, and eight as cases of organic reading disability, findings from 1949-1951 measures of perceptual functioning, intelligence, reading and spelling achievement with those from measures administered in 1962.

Silver, Archie A. and Hagin, Rosa A. "Specific Reading Disability: A Twelve-Year Follow-Up Study," *American Journal of Orthopsychiatry,* 33 (March 1963) 338-39.

Makes a followup of 25 specific reading disability cases, after 12 years, to assess perceptual and neurological maturity of all and of reading disability subgroups.

Simpson, Dorothy Margaret. *Perceptual Readiness and Beginning Reading.* 103 p. (Ph.D., Purdue University, 1960) *Dissertation Abstracts,* 21, No. 7, 1858. L.C. Card No. Mic 60-4214, microfilm $2.50, xerography $5.25 from University Microfilms.

Vision—Visual Discrimination

Examines the contribution of perceptual ability to first-grade reading achievement using 312 first graders and assesses the effectiveness of certain perceptual training activities in reading instruction.

Skinner, Georgieann Tuech. *Single Versus Multiple Modality in Visual and Auditory Discrimination Training.* 125 p. (Ed.D., Arizona State University, 1968) *Dissertation Abstracts,* 29, No. 4, 1172-73-A. Order No. 68-15,016, microfilm $3.00, xerography $6.00 from University Microfilms.

Assesses the effects of single and multiple modality visual and auditory discrimination training upon the visual and auditory discrimination ability of 10 intact classes of first-grade pupils in Phoenix, Arizona.

Slobodzian, Evelyn Birdsall. *The Relationship Between Certain Readiness Measures and Reading Achievement at Level One.* 157 p. (Ed.D., Temple University, 1968) *Dissertation Abstracts,* 29, No. 4, 1053-A. Order No. 68-14,151, microfilm $3.00, xerography $7.40 from University Microfilms.

Examines performances in visual-perceptual decoding, motor encoding, and oral encoding prior to formal reading instruction, on 115 first-grade subjects, as related to eventual reading achievement with the goal of locating single measures or combinations of measures capable of predicting reading success, and finds that successful readers generally had significantly higher Wechsler Intelligence Scale for Children verbal and performance scores and full-scale IQ's.

Smith, Frank. "The Use of Featural Dependencies Across Letters in the Visual Identification of Words, *Journal of Verbal Learning and Verbal Behavior,* 8 (April 1969) 215-18.

Presents findings from two studies investigating why letters in words are more easily identified than letters in isolation by college students.

Snyder, Robert T. and Freud, Sheldon L. "Reading Readiness and Its Relation to Maturational Unreadiness as Measured by the Spiral Aftereffect and Other Visual-Perceptual Techniques," *Perceptual and Motor Skills,* 25 (December 1967) 841-54.

Explores the relationship between success on the Spiral Aftereffect Test, other perceptual tests, and reading readiness tests with 667 first graders.

Solan, Harold A. "Visual Processing Training with the Tachistoscope: A Rationale and Grade One Norms," *Journal of Learning Disabilities,* 2 (January 1969) 30-37.

Proposes to establish a set of expected tachistoscopic responses which will identify children in grades 1, 2, and 3 whose visual sensory maturation is lagging using a percentile scale constructed on the performance of 250 children whose average age was 6 years, 5 months.

Solomon, R. L. "Emotions and Perceptions," *Claremont College Reading Conference Eighteenth Yearbook,* 69-81. (Claremont, California: Claremont College Curriculum Laboratory, 1953.)

Reviews the results of seven experiments the findings of which throw light on possible "relations between certain emotional states and certain perceptual phenomena" that might influence reading.

Spache, George D., *et al. A Study of a Longitudinal First Grade Reading Readiness Program.* 356 p. (CRP-2742, OEC-4-10-263, Florida State Department of Education, Tallahassee, 1965) ED 003 355, microfiche $0.65, hard copy $13.16 from EDRS.

Analyzes a longitudinal reading program for identification of growth in abilities, and the relationship between tests using 60 pupils from control and experimental classes who received intensive training in visual perception, auditory discrimination, and language skills.

Staats, Carolyn K.; Staats, Arthur W.; and Schultz, Richard E. "The Effects of Discrimination Pretraining on Textual Behavior," *Journal of Educational Psychology,* 53 (February 1962) 32-37.

Studies 36 subjects from two kindergartens who were matched on mental age and assigned to one of three discrimination pretraining groups to ascertain effects of this pretraining on textual behavior.

Sterritt, Graham M.; Martin, Virginia E.; and Rudnick, Mark. "The Role of Visual Perception: Sequential Pattern Perception and Reading," *Reading Disability and Perception,* G. D. Spache, Ed. International Reading Association Conference Proceedings, 13 (1969) 61-71.

Attempts to define the role of various kinds of sequence in perceptual abilities as related to the development of reading skills using 40 middle-class Caucasian third graders (20 boys and 20 girls) whose mean age was 109 months.

Sterritt, Graham M. and Rudnick, Mark. "Auditory and Visual Rhythm Perception in Relation to Reading Ability in Fourth Grade Boys," *Perceptual and Motor Skills,* 22 (June 1966) 859-64.

Studies relationships among mean scores of 36 boys on measures of intelligence, reading comprehension, and test of visual, auditory, and visual-auditory perception.

Strang, Harold Roger. *The Effects of Letter Directionality Cueing and Response Mode upon the Acquisition of Letter Reversal Discriminations in Four-Year-Old Children.* 112 p. (Ph.D., University of Kansas, 1967) *Dissertation Abstracts,* 28, No. 11, 4550-A. Order No. 68-6944, microfilm $3.00, xerography $5.60 from University Microfilms.

Vision—Visual Discrimination

Uses 49 4-year-old children placed in experimental and control groups to find that children who had been shown the directionality of the letter stimuli performed significantly better than those who were not shown directionality of the letters.

Strubing, Herbert Fred. *The Effect of Perceptual Training upon the Discrimination of Relativity of Position and Motion in Primary School Children.* 114 p. (Ed.D., State University of New York at Buffalo, 1967) *Dissertation Abstracts,* 28, No. 9, 3575-A. Order No. 67-11,518, microfilm $3.00, xerography $5.60 from University Microfilms.

Seeks to determine whether second-grade children's learning from the Science Curriculum Improvement Study unit on Relativity of Position and Motion can be enhanced by prior experience with and exposure to the Frostig Program unit on Perception of Spatial Relationships or the unit on Visual-Motor Coordination, and found that children's learning from the Relativity unit was enhanced by such learning.

Super, Selwyn. Spatial Perception of Language Symbols and a Description of a Test Designed to Assess this Function," *American Journal of Optometry and Archives of American Academy of Optometry,* 46 (June 1969) 426-33.

Describes a test for the selection of letter recognition as part of the assessment of a child's reading ability using a random sample of 60 good and poor achievers from a normal school, and 40 children of average or above intelligence from a special school for learning difficulties in grades 1 through 6.

Taylor, Richard L. "Processing of Spatial Location and Figural Identity in a Simulated Reading Task," *Psychonomic Science,* 18 (January 1970) 113-14.

Determines for 60 paid university-student volunteers the normal method of processing locations and figures when they appear as correlated stimulus messages, as in reading and visual-search tasks.

Vernon, M. D. *Backwardness in Reading: A Study of Its Nature and Origin.* (Cambridge: The University Press, 1958) 228 p.

Summarizes experimental and clinical studies of those who for some reason or other are unable to master the simple mechanics of reading, using the following headings: visual perception, auditory perception, innate factors, acquired defects, and environmental factors.

Vernon, M. D. "The Perceptual Process in Reading," *The Reading Teacher,* 13 (October 1959) 2-8.

Summarizes evidence from 22 studies relating to nature of the perceptual process in reading and how words are perceived.

Vernon, M. D. "Ten More Important Sources of Information on Visual Perception in Relation to Reading," *The Reading Teacher*, 20 (November 1966) 134-35.

Summarizes 10 selected studies on visual perception and reading.

Vernon, Magdalen, D. *Visual Perception and Its Relation to Reading: An Annotated Bibliography.* (Newark, Delaware: International Reading Association, 1966) 12 p.

Abstracts 55 studies under four headings: perception of shape by young children; perception of words by children; perception in backward readers; and perception of shapes, letters, and words by adults.

Wachs, Theodore D. and **Cromwell, Rue L.** "Perceptual Distortions by Mentally Retarded and Normal Children in Response to Failure Information," *American Journal of Mental Deficiency*, 70 (May 1966) 803-06.

Compares perceptual distortion scores under nonstress versus failure conditions for 22 educable mentally retarded children with an age-matched group of 22 mentally normal children who were required to read tachistoscopically presented letters and figures.

Walters, C. Etta. "Reading Ability and Visual-Motor Function in Second Grade Children," *Perceptual and Motor Skills*, 13 (December 1961) 370.

Makes a comparison of performance on the Memory-for-Designs Test and a balance test between grade 2 pupils who read at average or above and those who read below average.

Walters, Richard H. and **Kosowski, Irene.** "Symbolic Learning and Reading Retardation," *Journal of Consulting Psychology*, 27 (February 1963) 75-82.

Compares 24 each of advanced, average, and retarded readers in grades 6 to 8 on their ability to learn through visual and auditory stimuli in conjunction with the different reading levels, and assesses the effects of transfer from one sense modality to another.

Walton, Howard N. "Visual and Reading Improvement in Industry," *American Journal of Optometry and Archives of American Academy of Optometry*, 32 (November 1955) 563-77.

Reports the results of a study in which 56 bank personnel were given a reading improvement program designed to train the visual, perceptual, and reading skills essential for efficient clerical operations and effective reading.

Weathers, Lillian Louise. *A Comparison of Visual-Perceptual Development and Reading Achievement of Fifth Grade Adequate and Inadequate Readers.* 130 p.

(Ed.D., University of Oregon, 1966) *Dissertation Abstracts*, 27, No. 9, 2756-A. Order No. 67-1890, microfilm $3.00, xerography $6.20 from University Microfilms.

Describes and compares the visual-perceptual development of six groups of fifth-grade pupils classified as adequate readers, inadequate readers (24 boys and 7 girls were in each of the reading classifications), male adequate, female adequate, male inadequate, and female inadequate using the Frostig Test, and finds that there is a positive relationship between reading skills and visual-perceptual development.

Weiner, Paul S. "A Revision of the Chicago Test of Visual Discrimination," *Elementary School Journal*, 68 (April 1968) 373-80.

Reports on the standardization of the extended form of the Chicago Test of Visual Discrimination using 90 6-, 7-, and 8-year-olds as the extended form was correlated with intellectual functioning, visual motor ability, and school achievement (including reading) for 201 7- and 8-year-olds.

Weiner, Paul S.; Wepman, Joseph M.; and **Morency, Anne S.** "A Test of Visual Discrimination," *Elementary School Journal*, 65 (March 1965) 330-37.

Describes the development and standardization of the Chicago Test of Visual Discrimination and compares the performances of 28 good readers and 28 poor readers at the fourth-grade level on this test as well as on the Wepman Auditory Discrimination Test.

Wheelock, Warren H. "An Investigation of Visual Discrimination Training for Beginning Readers," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 101-05.

Studies the effect of training on the instant letter recognition and visual discrimination ability of 45 experimental kindergarten children as compared to 45 control children.

Wheelock, Warren H. and **Silvaroli, Nicholas M.** "An Investigation of Visual Discrimination Training for Beginning Readers," *Journal of Typographic Research*, 1 (April 1967) 147-56.

Compares visual discrimination ability for 45 experimental kindergartners who were trained to make instant responses of recognition to the capital letters of the alphabet with 45 control subjects receiving no training.

Wheelock, Warren Henri. *An Investigation of Letter-Form-Training on the Development of Instant Responses of Recognition to the Capital Letters of Our English Alphabet.* 96 p. (Ed.D., Arizona State University, 1965) *Dissertation Abstracts*, 26, No. 6, 3115. Order No. 65-10,391, microfilm $3.00, xerography $5.00 from University Microfilms.

Selects 90 kindergarten subjects from three schools at extremes of socioeconomic continuum in Phoenix, Arizona, and randomly divides them into experimental and control groups, giving the experimental group training to establish instant responses of recognition to capital letters; presents findings.

Whipple, Clifford I. and **Kodman, Frank, Jr.** "A Study of Discrimination and Perceptual Learning with Retarded Readers," *Journal of Educational Psychology*, 60 (February 1969) 1-5.

Compares the performances on a discrimination learning task and on a perceptual learning task between 60 fourth- and fifth-grade retarded readers and 60 normal readers matched for age, sex, grade placement, and IQ.

Wilhelm, Rowena. "Diagnostic Value of Test Score Differentials Found Between Measures of Visual and Auditory Memory in Severely Disabled Readers," *Academic Therapy Quarterly*, 2 (Fall 1966) 42-44, 58.

Compares scores in visual memory (Knox Cube Test) and auditory memory (Digit Span Test of the Wechsler Intelligence Scale for Children) for severely retarded readers and relates the differential to muscular tension, age, sex, and other variables.

Williams, Gertrude H. "What Does Research Tell Us About Readiness for Beginning Reading?" *The Reading Teacher*, 6 (May 1953) 34-40.

Summarizes contributions of 33 studies relating to five aspects of readiness for beginning reading: physical, intellectual, personal, language, and perceptual readiness.

Williams, Joanna P. "Training Kindergarten Children to Discriminate Letter-Like Forms," *American Educational Research Journal*, 6 (November 1969) 501-14.

Develops two experiments to determine the most effective of three training methods used to develop visual discrimination of forms resembling letters by 64 kindergarten children.

Wilson, F. R. and **Lane, H. L.** *Hue Labeling and Discrimination in Children with Primary Reading Retardation*. 25 p. (BR-6-1784-1, OEC-3-6-061784-0508, University of Michigan, 1967) ED 015 112, microfiche, $0.65, hard copy $3.29 from EDRS.

Compares the labeling and discrimination of colors in 10 Michigan male students from 9 years 10 months to 14 years 10 months with primary reading retardation with a matched group of normal children, and finds that the discrimination functions for both groups are better than predicted, and the normal group performed significantly more accurately than the retarded readers.

Vision—Visual Discrimination

Wittick, Mildred L. "Applying Research Findings in Word Perception to Classroom Practice," *Perception and Reading*, Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 125-30.

Cites 10 studies in summarizing research findings on word perception at preschool, kindergarten, and grade 1 levels.

Wylie, Richard Edward. *Word Element Perception in Beginning Reading.* 158 p. (Ed.D., Boston University School of Education, 1967) *Dissertation Abstracts*, 29, No. 12, 4398-A. Order No. 69-7839, microfilm $3.00, xerography $7.40 from University Microfilms.

Examines perceptual abilities in word element perception as they relate to success in beginning reading using 10 tests (three standardized, five informal, and two author constructed), and finds that children can easily learn letter names in a 10-day instructional period, and those who had learned names after school entry progress more slowly than those who had known them previously.

Part III

Perceptual Motor Development

This category contains material that encompasses such diverse topics as eye-hand dominance, visual-motor skills, and programs of perceptual motor development. Users should search Part II of this bibliography to be certain that all relevant materials are located. The two categories are not mutually exclusive.

Barton, Melvin I.; Goodglass, Harold; and **Shai, Amnon.** "Differential Recognition of Tachistoscopically Presented English and Hebrew Words in Right and Left Visual Fields," *Perceptual and Motor Skills,* 21 (October 1965) 431-47.

Shows 15 Hebrew and 15 English words that were printed vertically and presented tachistoscopically and monocularly to 20 Israeli students and just the English words to 10 Americans to determine whether alphabetic material arriving in the major cerebral hemisphere is more readily identified than material arriving in the hemisphere contralateral to the language areas.

Bosworth, Mary H. *Pre-Reading: Improvement of Visual-Motor Skills.* 144 p. (Ed.D., University of Miami, 1967) *Dissertation Abstracts,* 28, No. 9, 3545-A. Order No. 67-16,858, microfilm $3.00, xerography $6.80 from University Microfilms.

Evaluates the use of an arbitrarily determined sequence of learning activities for improving visual-motor skills of kindergarten subjects and concludes that kindergarten pupils could be trained to reproduce selected geometric figures, and improve their word discrimination ability by training with selected geometric figures.

Bryden, M. P. "Left-Right Differences in Tachistoscopic Recognition: Directional Scanning or Cerebral Dominance," *Perceptual and Motor Skills,* 23 (December 1966) 1127-34.

Compares left-right differences in the visual recognition of single and multiple letter stimuli for 26 right-handed undergraduates, as well as compares mean recognition scores for normally-oriented and mirror-imaged letters for 46 undergraduate subjects.

Capobianco, R. J. "Ocular-Manual Laterality and Reading in Adolescent Retardates," *American Journal of Mental Deficiency,* 70 (March 1966) 781-85.

Determines relationships between measured ocular-manual laterality, age, measured intelligence, and reading achievement for 34 mentally retarded adolescents

demonstrating established preference patterns and 24 demonstrating nonestablished preference patterns.

Chang, Thomas M. C. and Chang, Vivian A. C. "Relation of Visual-Motor Skills and Reading Achievement in Primary-Grade Pupils of Superior Ability," *Perceptual and Motor Skills,* 24 (February 1967) 51-53.

Correlates scores between the Bender, Wechsler Intelligence Scale for Children, and Gates Reading Tests made by 50 second and 50 third graders of superior intelligence who were divided into subgroups on the basis of Bender Gestalt Test Scores.

Cohen, Alice. "Relationship Between Factors of Dominance and Reading Ability," *Reading Disability and Perception,* G. D. Spache, Ed. International Reading Association Conference Proceedings, 13, Part 3 (1969) 38-45.

Examines laterality and knowledge of left and right among 120 good and poor readers (30 good and 30 poor readers in each of the first and fourth grades) with average intellectual ability, and finds no significant relationship between dominance or directional knowledge and reading.

Denomme, Sister M. Yvonne, IHM. *Relationship of an Ocularmotor Variable to Reading Achievement and Feelings of Inadequacy.* 69 p. (Ed.D., Wayne State University, 1967) *Dissertation Abstracts,* 29, No. 1, 144-A. Order No. 68-9956, microfilm $3.00, xerography $3.80 from University Microfilms.

Examines the relationship of reading achievement to the ocularmotor skills of left-to-right motion and pursuit using 36 subjects ranging from 6½ to 9 years of age.

DiMeo, Katherine P. "Visual-Motor Skills: Response Characteristics and Pre-Reading Behavior," *Journal of Typographic Research,* 3 (April 1969) 169-82.

Investigates assumed facets of 58 kindergarten subjects' visual-motor skills and the relationship between achievement in these skills and a measure of visual perceptual reading readiness.

DiMeo, Katherine Pappas. *Visual-Motor Skills: Response Characteristics and Pre-Reading Behavior.* 284 p. (Ph.D., University of Miami, 1967) *Dissertation Abstracts,* 28, No. 7, 2552-A. Order No. 67-16,866, microfilm $3.65, xerography $12.85 from University Microfilms.

Studies facets of kindergarten subjects' visual-motor skills and the relationship between achievement in these skills and a measure of visual-perception reading readiness using the following tests: finger agnosia, Lorge-Thorndike Intelligence, Word-Form Test of the Betts Ready-to-Read, visual-motor, visual-haptic-kinesthetic, and visual-discrimination.

Dyer, Dorothy W. and Harcum, E. Rae. "Visual Perception of Binary Patterns by Preschool Children and by School Children," *Journal of Educational Psychology*, 52 (June 1961) 161-65.

Uses nursery, kindergarten, grades 1 and 2 pupils to test the hypotheses that (1) prior to reading instruction, observers reveal no difference in accuracy of reproduction of meaningless elements on either side of the central fixation point, but (2) after learning to read they are more accurate in the left hemifield.

Falik, Louis H. "The Effects of Special Perceptual-Motor Training in Kindergarten on Reading Readiness and on Second Reading Grade Performance," *Journal of Learning Disabilities*, 2 (August 1969) 395-402.

Attempts to test the efficacy of providing special perceptual-motor training as part of the general kindergarten curriculum using a sample of 42 children (20 in an experimental group and 22 in the control group), and finds no significant differences at the end of the kindergarten year and at mid-year in the second grade.

Faustman, Marion Neal. *Some Effects of Perception Training in Kindergarten on First-Grade Success in Reading*. 296 p. (Ed.D., University of California, 1966) *Dissertation Abstracts*, 27, No. 4, 951-A. Order No. 66-8244, microfilm $3.80, xerography $13.50 from University Microfilms.

Analyzes the effect of kindergarten training in perception upon first-grade reading achievement and finds that the first-grade reading achievement results indicate a significant, positive effect of perception training on reading skill.

Giebink, John W. and Goodsell, Linda L. "Reading Ability and Associative Learning for Children with a Visuomotor Deficit," *American Educational Research Journal*, 5 (May 1968) 412-20.

Examines the paired-associate learning ability of 72 primary grade children with a visuomotor deficit who were matched on sex, age, intelligence, and visuomotor ability and divided into two groups: good and poor readers.

Gilbert, Luther C. "Functional Motor Efficiency of the Eyes and Its Relations to Reading," *University of California Publications in Education*, 11, No. 3 (1953) 159-231.

Presents the results of a study of growth in simple oculomotor control of the eyes as revealed through photographic records of eye-movements in reading digits and words in context by 486 pupils in grades 1 to 9 and by 42 college students, and its relationship to chronological age, to intelligence, and to reading achievement.

Goodglass, H. and Barton, M., "Handedness and Differential Perception of Verbal Stimuli in Left and Right Visual Fields," *Perceptual and Motor Skills*, 17 (December 1963) 851-54.

Uses eight left-handed and 12 right-handed adults to investigate the association of handedness, recognition thresholds for verbal stimuli, and visual half-fields, both right and left.

Gould, Lawrence N.; Henderson, Edward; and Scheele, Raymond L. "Vision Motor Perception Program in the Brentwood Public Schools," *Improvement of Reading Through Classroom Practice.* International Reading Association Conference Proceedings, 9 (1964) 271-75.

Describes the development of an elementary program in which specific cognitive operations are structured discussing implications for developing reading readiness.

Hagin, Rosa A.; Silver, Archie A.; and Hersh, Marilyn F. "Specific Reading Disability: Teaching by Stimulation of Deficit Perceptual Areas," *Reading and Inquiry,* J. A. Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 368-70.

Concludes that perception is modifiable by training and that improved perception is reflected in increased reading achievement.

Harcum, E. Rae and Smith, Nelson F. "Effect of Pre-Known Stimulus-Reversals on Apparent Cerebral Dominance in Word Recognition," *Perceptual and Motor Skills,* 17 (December 1963) 799-810.

Makes an investigation of the phenomenon whereby the relative accuracy between hemifields in reproducing tachistoscopically exposed words was affected by reversing the orientation and sequence of the letters.

Hurley, Oliver L. "Perceptual Integration and Reading Problems," *Exceptional Children,* 35 (November 1968) 207-15.

Investigates the relationship between reading and a battery of tests of visual-tactical-kinesthetic integration for 40 matched pairs of pupils primarily from second and third grades.

Jackson, Boyd B. "Perception and the Handicapped College Reader," *College and Adult Reading,* D. M. Wark, Ed. Yearbook of the North Central Reading Association, 5 (1968) 123-33.

Reviews selected studies and presents one research proposal on the perceptual-motor performance of college students in identifying an area of needed research.

Jensen, Norma J. and King, Ethel M. "Effects of Different Kinds of Visual-Motor Discrimination Training on Learning to Read Words," *Journal of Educational Psychology,* 61 (April 1970) 90-96.

Assesses the effectiveness of three methods of visual-motor discrimination training

(tracing, rearranging, and matching) on learning to recognize a list of four words using 120 children from six kindergarten classes in Calgary, Canada.

Jones, M. H., *et al.* "Reading Readiness Studies—Suspect First Graders," *Perceptual and Motor Skills,* 23 (August 1966) 103-12.

Determines relationships between elector-oculogram ratings and psychometric, readiness, and reading achievement scores for a high readiness group of 18 and a low readiness group of 17 first graders and compares findings in pediatric-neurological examinations for the groups.

Keogh, Barbara K. and Smith, Carol E. "Visuo-Motor Ability for School Prediction: A Seven-Year Study," *Perceptual and Motor Skills,* 25 (August 1967) 101-10.

Investigates the relationship between the Bender-Gestalt and school achievement (reading, spelling, and arithmetic) using a longitudinal paradigm with scores for 41 boys and 32 girls at kindergarten, grade 3, and grade 6.

Kephart, N. C. "Perceptual-Motor Aspects of Reading," *Reading and Inquiry,* J. A. Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 363-66.

Reviews research evidence from 11 recent publications relating to the importance of perceptual-motor factors in reading.

Lachmann, Frank M. "Perceptual-Motor Development in Children Retarded in Reading Ability," *Journal of Consulting Psychology,* 24 (October 1960) 427-31.

Makes a report of the relationship between perceptual-motor development of retarded readers, emotionally disturbed, and normals, to determine etiology of possible developmental lags.

Lagrone, C. W. and Barratt, E. S. "Accuracy of Perception in Peripheral Vision in Relation to Intellectual Abilities Among Subjects Selected on the Basis of Dextrality," *The Journal of Psychology,* 28, Second Half (October 1949) 255-64.

Presents the results of an investigation involving 79 university freshmen which aimed to determine "if the manner in which accuracy of perception in peripheral vision is related to intellectual abilities is partially a function of dextrality."

Leavell, Ullin W. "The Problem of Symbol Reversals and Confusions, Their Frequency and Remediation," *Peabody Journal of Education,* 32 (November 1954) 130-41.

Reviews previous studies which show the importance of unilateral hand-eye coordination in relation to language arts skills, reports the results of an experiment

which aimed to promote such coordination through the use of a hand-eye coordinator and to show its influence on achievement in various language arts.

Leton, Donald A. "Visual-Motor Capacities and Ocular Efficiency in Reading," *Perceptual and Motor Skills*, 15 (October 1962) 407-32.

Makes an evaluation of selected psychometric tests of visual-motor abilities and development of clincial procedures for the electrical recording of oculo-motor patterns to compare retarded readers with nonretarded by testing seven boys whose reading difficulty appeared to be due to perceptual factors, 6 boys who showed emotional maladjustment in addition to a reading disability, and 8 boys of comparable age and grade levels with average-to-good reading skills.

Linn, John R. and **Ryan, Thomas J.** "The Multi-Sensory–Motor Method of Teaching Reading," *Journal of Experimental Education*, 36 (Summer 1968) 57-59.

Reports the results of an experiment comparing the achievement of three classes taught by the multi-sensory-motor method and one class taught by the traditional method using 72 matched pairs of grade 1 subjects divided into experimental and control groups as well as three IQ categories.

Maclean, George R. and **Kean, Edward B.** "Evaluation of Quantitative Data for Hand-Eye Coordination with Respect to Determining Its Correlation with Reading Disability," *Multidisciplinary Aspects of College-Adult Reading*, G. B. Schick and M. M. May, Eds. Yearbook of the National Reading Conference, 17 (1968) 96-102.

Correlates scores on a machine-administered eye-hand coordination test with reading achievement test scores for 2,000 subjects in the even numbered grades 2 through 12, plus grades 7 and 9.

McCormick, Clarence C.; **Schnobrich, Janice N.**; and **Footlik, S. Willard.** "The Effect of Perceptual-Motor Training on Reading Achievement," *Academic Therapy Quarterly*, 4 (Spring 1969) 171-76.

Compares the test scores of 63 first-grade pupils from two classes to determine the effects of perceptual-motor training on reading achievement; isolates the effects on pupil reading below grade level and of average IQ for comparison.

Muehl, Siegmar. "Relation Between Word-Recognition Errors and Hand-Eye Preference in Preschool Children," *Journal of Educational Psychology*, 54 (December 1963) 316-21.

Administers tests of hand and eye choices to 62 preschool children who were divided into two age groups to investigate visual orienting behavior as it relates to word stimuli and hand-eye preferences.

Overton, Willis and Wiener, Morton. "Visual Field Position and Word Recognition Threshold," *Journal of Experimental Psychology*, 71 (February 1966) 249-53.

Investigates right versus left field recognition behavior by use of monocular viewing condition for 25-letter words at two distances from fixation using 16 college students having 20/20 vision.

Rengstorff, Roy H. "The Types and Incidence of Hand-Eye Preference and Its Relationship with Certain Reading Abilities," *American Journal of Optometry and Archives of American Academy of Optometry*, 44 (April 1967) 233-38.

Investigates hand-eye preference and relates it to reading ability for 5,546 subjects (ages 5 to 75) from six different population samples.

Roach, Eugene G. "Evaluation of an Experimental Program of Perceptual-Motor Training with Slow Readers," *Vistas in Reading*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 11, Part 1 (1966) 446-50.

Measures the effect on the reading achievement of 40 slow readers (age range 95 to 160 months) who received 8 weeks of perceptual-motor training as compared with a control group of 40 children who received no training.

Rutherford, William L. "Perceptual-Motor Training and Readiness," *Reading and Inquiry*, J. Allen Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 294-96.

Describes a play program designed to develop laterality, directionality, accurate body image concepts, visual-kinesthetic matching, and binocular and monocular control with kindergarten children.

Rutherford, William Lewis. *The Effects of a Perceptual-Motor Training Program on the Performance of Kindergarten Pupils on Metropolitan Readiness Tests.* 108 p. (Ed.D., North Texas State University, 1964) *Dissertation Abstracts*, 25, No. 8, 4583-84. Order No. 65-1150, microfilm $2.75, xerography $5.40 from University Microfilms.

Evaluates 64 children enrolled in four kindergarten classes and indicates from the findings that the perceptual-motor training program used in this study was highly effective in promoting total readiness as measured by the Metropolitan Readiness Tests.

Sheffer, Marjorie J. "A Study of the Effect of Visual-Motor-Tactile Skills Development on Standardized Readiness Test Performance," *Reading Quarterly*, 3 (Fall 1969) 28-35.

Uses a visual-motor-tacticle skills program in combination with a traditional readiness program on 89 kindergarten children (control group of 45 and

experimental group of 44) to determine if readiness to learn would be increased significantly, and found when comparing scores on two forms of the Metropolitan Readiness Tests (used as pretests and post-tests) no significant difference.

Shorr, Robert H. and Svagr, Virginia B. "Relationship of Perceptual and Visual Skills with Reading Accuracy and Comprehension," *Journal of the Optometric Association,* 37 (July 1966) 671-77.

Examines the relationship between overall performance on perceptual-motor and visual-perceptual test scores and performance on the Gilmore Reading Test for 31 middle-class second-grade children.

Singer, Robert N. and Brunk, Jason W. "Relation of Perceptual-Motor Ability and Intellectual Ability in Elementary School Children," *Perceptual and Motor Skills,* 24 (January 1967) 967-70.

Correlates results from a perceptual-motor test with a test of intellectual ability and the Stanford Achievement total and subtest scores for 48 third graders and 43 fourth graders from upper middle class families.

Smith, Linda C. "A Study of Laterality Characteristics of Retarded Readers and Reading Achievers," *Journal of Experimental Education,* 18 (June 1950) 321-29.

Summarizes findings of related studies and presents the results of tests given to 100 children ranging in age from 9 to 14 to determine the extent to which "laterality test findings can be used to differentiate between retarded readers and reading achievers."

Snyder, Robert T. and Freud, Sheldon L. "Reading Readiness and Its Relation to Maturational Unreadiness as Measured by the Spiral Aftereffect and Other Visual-Perceptual Techniques," *Perceptual and Motor Skills,* 25 (n.m. 1967) 841-54.

Explores the relationship between success on the Spiral Aftereffect Test, other perceptual tests, and reading readiness tests for 667 first graders.

Stephens, Wyatt E.; Cunningham, Ernest S.; and Stigler, B. J. "Reading Readiness and Eye Hand Preference Patterns in First Grade Children," *Exceptional Children,* 33 (March 1967) 481-88.

Assesses the relationship between sex, age, IQ, reading readiness test scores, and patterns of eye-hand preference for 44 boys and 45 girls beginning first grade.

Stevenson, Lillian P. and Robinson, Helen M. "Eye-Hand Preference, Reversals, and Reading Progress," *Clinical Studies in Reading, II.* Supplementary Educational Monographs No. 77, 83-88. (Chicago: University of Chicago Press, 1953.)

Bases conclusions on the results of a study of the eye-hand preferences and

directional tendencies of 60 kindergarten children and their subsequent reading progress over a period of approximately 2 years.

Swanson, Rebecca Glover. *A Study of the Relationship Between Perceptual-Motor Skills and the Learning of Word Recognition.* 294 p. (Ph.D., University of South Carolina, 1968) *Dissertation Abstracts,* 29, No. 7, 2158-A. Order No. 69-480, microfilm $3.80, xerography $13.30 from University Microfilms.

Investigates the effects of a perceptual-motor training program on 63 randomly selected lower socioeconomic Negro second-grade children who were poor in word recognition skills.

Taylor, Raymond G., Jr. and Nolde, S. Van L. "Correlative Study Between Reading, Laterality, Mobility, and Binocularity," *Exceptional Children,* 35 (April 1969) 627-31.

Examines the relationship between the neurological organization and reading achievement of 50 disabled readers, who were given treatment according to Delacato's techniques, and concludes that their findings neither support nor nullify hypotheses concerning Delacato's theory.

Taylor, Stanford E. "The Relationship of the Oculo-Motor Efficiency of the Beginning Reader to Success in Learning to Read," *Reading and Inquiry,* J. A. Figurel, Ed. International Reading Association Conference Proceedings, 10 (1965) 358-61.

Reports interim findings from eye-movement photography of 95 first and second graders during the second year of a 4-year study of relationships between certain oculo-motor performances and reading achievement.

Van de Riet, Vernon and Van de Riet, Hani. "Visual-Motor Coordination in Underachieving and 'Normal' School Boys," *Perceptual and Motor Skills,* 19 (December 1964) 731-34.

Ascertains whether learning disabilities are related to visual-motor coordination by testing 45 boys who were achieving below average in all areas (including reading) in fourth through sixth grades and 45 controls on the Ellis Visual Designs.

Werner, Emmy E.; Simonian, Ken; and Smith, Ruth S. "Reading Achievement, Language Functioning and Perceptual-Motor Development of 10- and 11-Year-Olds," *Perceptual Motor Skills,* 25 (October 1967) 409-20.

Explores the effectivenss of the Science Research Associates Primary Mental Abilities and the Bender-Gestalt in identifying reading problems among 369 boys and 381 girls ages 10 and 11 and also studies the relationships between language habits and reading problems.

Vision—Visual Discrimination

Williams, Harriet G. *The Effects of Systematic Variation of Speed and Direction of Object Flight and of Skill and Age Classifications upon Visuo-Perceptual Judgments of Moving Objects in Three-Dimensional Space. Final Report.* 237 p. (BR-6-8102, OEG-3-7-068102-0486, Toledo University, Ohio, January 1968) ED 018 357, microfiche $0.65, hard copy $9.87 from EDRS.

Investigates the effects of variations in the speed and direction of a flying object on visuo-perceptual judgments, differences in the ability of skilled and unskilled subjects in making such judgments, and the effects of age or maturity level on the speed and accuracy of such judgments using 54 male junior high, high school, and college students.

Part IV

Eye Movements

Under the category designated "Eye Movements" have been included all literature dealing with eye movement photography and with the various physical movements of the eyes. Research reports and discussions of fixations, regressions, saccadic movements, and span of perception, among others, are included in this part.

Ballantine, Francis A. "Age Changes in Measures of Eye-Movements in Silent Reading," *Studies in the Psychology of Reading.* University of Michigan Monographs in Education, No. 4, 65-111. (Ann Arbor, Michigan: University of Chicago Press, April 1951.)

Summarizes eye-movement data secured from 10 boys and 10 girls each in grades 2, 4, 6, 8, 10, and 11 to obtain growth curves for various eye-movement measures, to discover at what age growth for the measures levels off, and to compare the growth curves for the easy and graded passages.

Barton, Melvin I.; Goodglass, Harold; and Shai, Amono. "Differential Recognition of Tachistoscopically Presented English and Hebrew Words in Right and Left Visual Fields," *Perceptual and Motor Skills,* 21 (October 1965) 431-47.

Shows 15 Hebrew and 15 English words that were printed vertically and presented tachistoscopically and monocularly to 20 Israeli students and just the English words to 10 Americans to determine whether alphabetic material arriving in the major cerebral hemisphere is more readily identified than material arriving in the hemisphere contralateral to the language areas.

Blea, William. *A Photographic Study of the Eye Movements of Profoundly Deaf Children During the Process of Reading.* 107 p. (Ed. D., University of Kansas, 1967) *Dissertation Abstracts,* 28, No. 11, 4473-A. Order No. 68-6948, microfilm $3.00, xerography $5.40 from University Microfilms.

Studies the relationship between eye movements in deaf readers and reading skills using 40 hearing and 70 deaf fourth and fifth graders, and finds that deaf students appeared to contradict their poor reading skills when a comparison was made of their inefficient fixation skills and their apparent proficiency in having fewer regressions than the hearing students.

Brown, Don Arlen. *The Effect of Selected Purposes on the Oculo-Motor Behavior and Comprehension of Third and Seventh Grade Students of Fifth Grade Reading*

Ability. 133 p. (Ed.D., University of Oregon, 1964) *Dissertation Abstracts*, 25, No. 10, 5727. Order No. 65-2458, microfilm $2.75, xerography $6.40 from University Microfilms.

Investigates the effect of reading for different purposes on the oculomotor behavior efficiency and comprehension of advanced third-grade readers and retarded seventh-grade readers using the Gates Reading Survey, Wechsler Intelligence Scale for Children, experimental reading sets (to read in usual manner, to read to understand main idea, to read for detailed information), and eye-movement photography.

Cleland, Donald L. "Some Behavioral Research in Reading," *Self and Society*, M. P. Douglass, Ed. Yearbook of the Claremont Reading Conference, 32 (1968) 155-72.

Reports data secured from selected studies on eye behavior, effects of drugs on reading, physiological responses to metaphor, and on electro-myographic measures of neural activity; draws five implications from discussion of 40 reterences.

Conant, Lawrence Franklin. *A Study of Eye Movement Behavior in the Reading Performance of Mature Readers on Reading Selections of Increasing Difficulty*. 136 p. (Ph.D., University of Oregon, 1964) *Dissertation Abstracts*, 25, No. 12, Part 1, 7075-76. Order No. 65-2462, microfilm $2.75, xerography $6.60 from University Microfilms.

Examines the eye movements and comprehension efficiency of 24 sophomore or junior college students given experimental reading selections from the sixth, tenth, fourteenth, and graduate levels and finds a signficant change in eye-movement behavior over the four levels.

Dixon, W. Robert. "Studies of the Eye-Movements in Reading of University Professors and Graduate Students," *Studies in the Psychology of Reading*. University of Michigan Monographs in Education, No. 4, 113-78. (Ann Arbor, Michigan: University of Michigan Press, April 1951.)

Summarizes eye-movement data secured from 16 professors and 16 graduate students from each of three departments (education, history, physics) to determine if different reading habits are induced by different kinds of subject matter and if specialization in a given field affects reading performances in other fields.

Dizney, Henry; Rankin, Richard; and Johnston, James. "Eye-Movement Fixations in Reading as Related to Anxiety in College Females," *Perceptual and Motor Skills*, 28 (June 1969) 851-54.

Compares nine highly anxious female college students with nine of low anxiety and found that the former made more eye movements.

Dyer, Dorothy W. and Harcum, E. Rae. "Visual Perception of Binary Patterns by Preschool Children and by School Children," *Journal of Educational Psychology*, 52 (June 1961) 161-65.

Uses nursery, kindergarten, grades 1 and 2 pupils, to test the hypotheses that (1) prior to reading instruction, observers reveal no difference in accuracy of reproduction of meaningless elements on either side of the central fixation point, but (2) after learning to read they are more accurate in the left hemifield.

Eames, Thomas H. "The Relationship of the Central Visual Field to the Speed of Visual Perception," *American Journal of Ophthalmology*, 63 (February 1957) 279-80.

Bases conclusions on data from 50 subjects, ranging in age from 5 throuh 17, including measures of central fields through the use of a campimeter, and of speed of visual perception with a tachistoscope and other devices.

Edwards, Allan E. "Subliminal Tachistoscopic Perception as a Function of Threshold Method," *Journal of Psychology*, 50 (July 1960) 139-44.

Uses, compares, and evaluates three methods of testing thresholds of perception of words in terms of sensitivity to show the relativity of "sublimal" and "supra-liminal" perception.

Efron, Marvin. *A Study of the Relationship of Certain Oculomotor Skills to Reading Readiness.* 55 p. (CRP-S-211, South Carolina University, Columbia, School of Education, 1965) ED 003 470, microfiche $0.65, hard copy $3.29 from EDRS.

Studies the relationship between oculomotor skills of 46 kindergarten children of middle-range intelligence to reading readiness or reading achievement using scores from the Metropolitan Readiness and Achievement Tests and a "reading eye" camera which photographed eye movements (ocular mobility, accuracy of fixation, and visual convergence and fusion), and concludes that there was no significant relationship.

Erdley, Russell Richard. *Patterns of Eye Movements in Word Learning.* 77 p. (Ph.D., The Florida State University, 1967) *Dissertation Abstracts*, 28, No. 7, 2439. Order No. 68-350, microfilm $3.00, xerography $4.20 from University Microfilms.

Surveys the extent to which average readers at the second-, third-, and fourth-grade reading levels consider every letter in their attempt to learn printed words and the patterns of eye movements which accompany learning new words.

Evans, Richard M. "Eye-Movement Photography as a Criterion for Measuring Differences Between Students in i.t.a. and t.o. Reading Instructional Programs," *Illinois School Research*, 4 (May 1968) 52-55.

Investigates the use of eye-movement photography as a means of determining differences in the reading behavior of 18 first graders and 20 third graders, half taught to read using the Initial Teaching Alphabet and half taught in traditional orthography.

Flatt, Earle Edward. *The Influence of Individualized Eye-Span Training with Digits on Effective Reading Rate.* 146 p. (Ph.D., The University of Connecticut, 1966) *Dissertation Abstracts,* 27, No. 10, 3221-A. Order No. 67-4548, microfilm $3.00, xerography $7.00 from University Microfilms.

Investigates the influence on effective reading rate of individualized tachistoscopic training with digits and finds a significant increase in digit perceptual span of students who have the training, but no significant improvement in effective reading rate, words read per minute, or silent reading comprehension.

Forgays, Donald G. "The Development of Differential Word Recognition," *Journal of Experimental Psychology,* 45 (March 1953) 165-68.

Summarizes the responses of 12 subjects at each educational level from grades 2 to 10 inclusive and from grades 13 to 15 inclusive to 20 three- or four-letter English words, tachistoscopically presented to determine if educational training influences differential recognition of words presented to the right and left of central fixation.

Freeburne, Cecil Max. "The Influence of Training in Perceptual Span and Perceptual Speed upon Reading Ability," *Journal of Educational Psychology,* 40 (October 1949) 321-52.

Presents the results of a controlled study using college freshmen in six remedial classes to determine the relationships among perceptual speed, perceptual span, and reading ability, and the effect upon reading performance of training in perceptual span and perceptual speed.

Geyer, John J. "Perceptual Systems in Reading: The Prediction of a Temporal Eye-Voice Span," *Perception and Reading,* Helen K. Smith, Ed. Proceedings of the International Reading Association, 12, Part 4 (1968) 44-53.

Explains a heuristic model of perception in reading and tests four hypotheses concerning temporal eye-voice span during smooth and interrupted reading.

Geyer, John Jacob. *Perceptual Systems in Reading: A Temporal Eye-Voice Span Constant.* 194 p. (Ph.D., University of California, Berkeley, 1966) *Dissertation Abstracts,* 28, No. 1, 122-A. Order No. 67-8562, microfilm $3.00, xerography $8.80 from University Microfilms.

Evaluates an heuristic model of perception using synchronized eye-movement and voice recordings of the oral reading of three passages by eight subjects which yielded 1,465 eye-voice span pairings for analysis.

Gilbert, Luther C. "Genetic Study of Eye-Movements in Reading," *Elementary School Journal*, 54 (March 1959) 328-35.

Compares the number of fixations and regressions per 100 words and the duration of fixations in prose reading of 22 subjects when in the second grade and again when college juniors and seniors; also for seven subjects at the second, fourth, and sixth grades and in college.

Gilbert, Luther C. "Saccadic Movements as a Factor in Visual Perception in Reading," *Journal of Educational Psychology*, 50 (January 1959) 15-19.

Summarizes data from 76 college and graduate students which were secured in exploring the relationship between the speed and accuracy of perception in reading simple prose both with and without saccadic movements of the eyes.

Gilbert, Luther C. "Speed of Processing Visual Stimuli and Its Relation to Reading," *Journal of Educational Psychology*, 50 (January 1959) 8-14.

Summarizes data from 64 college and graduate students which were secured to find out the influence of varying the processing times for the first stimulus before the eyes were permitted to encounter an interfering stimulus.

Gray, William S. "A Study of Reading in Fourteen Languages," *The Teaching of Reading and Writing: An International Study*. Monographs on Fundamental Education, 53-59. (Paris, France: UNESCO House, 1956.) (Distributed in the U.S. by Scott, Foresman and Company, Chicago.)

Presents an analysis of the eye-movement records of mature readers of 14 different languages to determine if the basic processes involved in reading languages that differ in form and structure are similar or different.

Hackman, Ray B. and **Tinker, Miles A.** "Effect of Variations in Color of Print and Background upon Eye Movements in Reading," *American Journal of Optometry and Archives of American Academy of Optometry*, 34 (July 1957) 354-59.

Presents and interprets the eye movements of 49 subjects, photographed while reading four short paragraphs in each of several color combinations of ink and paper.

Harcum, E. R. "Visual Hemifield Differences as Conflicts in Direction of Reading," *Journal of Experimental Psychology*, 72 (n.m. 1966) 479-80.

Investigates right-left hemifield differences for 18 subjects who observed 120 8-letter English words, equally distributed randomly to left or right sides of fixation under one of four orientation-sequence conditions.

Harcum, E. Rae. "Hemifield Differences in Visual Perception of Redundant Stimuli," *Canadian Journal of Psychology*, 22 (June 1968) 197-211.

Examines the effects in left and right visual hemifields of redundancy and the effects of a large space between the two central letters of an eight-letter pattern, using real and nonsense words and parts of words with 32 college students.

Harcum, E. Rae and Dyer, Dorothy W. "Monocular and Binocular Reproduction of Binary Stimuli Appearing Right and Left of Fixation," *American Journal of Psychology,* 75 (March 1962) 56-65.

Compares the relative accuracy of reproducing visual patterns, appearing at both left and right of the fixation point, using 12 college students and a tachistoscope.

Hicks, Robert Murray. *An Investigation of the Trainability of Perceptual Span.* 82 p. (Ph.D., University of Oregon, 1968) *Dissertation Abstracts,* 29, No. 7, 2117-A. Order No. 69-23, microfilm $3.00, xerography $4.40 from University Microfilms.

Examines the feasibility of training perceptual span using 44 randomly selected undergraduate students who were divided into two groups: the first received practice in reading meaningful word-phrases for 20 minutes daily for 20 days, while the second received no treatment and served as controls.

Klare, Geomir H. and Nichols, William H. "The Relationship of Style Difficulty, Practice and Ability to Efficiency of Reading and to Retention," *Journal of Applied Psychology,* 41 (August 1957) 222-26.

Draws conclusions from the results of tests, including eye-movement records, based on two versions of a passage, "one in an 'easy' and one in a 'hard' style," the subjects including two groups of male airmen, 60 of whom ranked high in mechanical aptitude and 60 ranked low.

Kolers, Paul A. "Clues to a Letter's Recognition: Implications for the Design of Characters," *Journal of Typographic Research,* 3 (April 1969) 145-68.

Studies the sweep of the eyes in reading and letter recognition, under conditions of rotation around vertical and horizontal axes, to determine the optimal characteristics of print.

Kolers, Paul A. "Reading is Only Incidentally Visual," *Psycholinguistics and the Teaching of Reading,* K. S. Goodman and J. T. Fleming, Eds. (Newark, Delaware: International Reading Association, 1969) 8-16.

Reports two studies with college students in which one involved speed in naming variously transformed and spaced letters, and the other, pronunciation mistakes of bilinguals reading connected discourse consisting of mixed French and English phrases.

Laffey, James L. "Behavioral Research that Has Promise in the Teaching of

Reading," *Progress and Promise in Reading Instruction*, Donald L. Cleland and Elaine C. Vilscek, Eds. A Report of the Annual Conference and Course on Reading, University of Pittsburg, 22 (1966) 76-86.

Reviews reading studies involving use of electromyographic data to measure subvocalization and neural activity, application of operant conditioning and reinforcement principles, data on eye movements paired associate learning, and effect of drugs on reading; cites 22 references.

Laycock, Frank. "Significant Characteristics of College Students with Varying Flexibility in Reading Rate: I. Eye-Movements in Reading Prose; II. Motor and Perceptual Skill in 'Reading' Material Whose Meaning is Unimportant," *Journal of Experimental Education*, 23 (June 1955) 311-30.

Reports the results of two studies to determine more fully the characteristics of college students all of whom had similar general reading ability but who differed in ability to adjust their speed of reading to the demands of different situations.

Lehrman, Raymond Henry. *The Effects of Social Reinforcement of Pass or Fail on Comprehension and Eye-Movement Behavior of Seventh-Grade Boys at Three Levels of Reading Ability During a Series of Equated Reading Tasks.* 90 p. (Ed.D., University of Oregon, 1966) *Dissertation Abstracts*, 27, No. 9, 2889-A. Order No. 67-1864, microfilm $3.00, xerography $4.60 from University Microfilms.

Assesses the effect of social reinforcement (pass) or lack of social reinforcent (fail) on 120 seventh-grade boys, who were placed in one of three groups according to measured reading achievement, and analyzed by means of a Reading Eye camera and a 10-question, true-false oral exam after each of the six short selections they had to read.

Leton, Donald A. "Visual-Motor Capacities and Ocular Efficiency in Reading," *Perceptual and Motor Skills*, 15 (October 1962) 407-32.

Makes an evaluation of selected psychometric tests of visual-motor abilities and development of clinical procedures for the electrical recording of oculo-motor patterns to compare retarded readers with nonretarded using as subjects 7 boys whose reading difficulty appeared to be due to perceptual factors, 6 boys who showed emotional maladjustment in addition to a reading disability, and 8 boys of comparable age and grade levels with average-to-good reading skills.

Levin, Harry and Turner, Elizabeth Ann. *Sentence Structure and the Eye-Voice Span. Studies in Oral Reading, IX. Preliminary Draft.* 27 p. (BR-5-1213-9, OEC-6-10-156, September 1966) ED 011 957, microfiche $0.65, hard copy $3.29 from EDRS.

Investigates the effects of the grammatical structure of reading materials on the eye-voice span using 10 subjects from grades 2, 4, 6, 8, and 10 and adults tested

with four types of sentences (using second-grade or sixth-grade vocabulary) constructed with phrase units of two, three, and four words, and seeing how far subjects can continue reading when print is no longer visible.

Mann, Gloria T. "Eye Movements of Children in Reading English and Hebrew," *Journal of Experimental Education*, 36 (Summer 1968) 60-68.

Analyzes and compares the differences in fixations, regressions, reading rate, duration of fixations, and span of recognition in reading English and Hebrew using nine second-grade children and six third-grade children who were being given a half-day of instruction in each language, and found all the data significantly favored English.

Morse, William C. "A Comparison of the Eye-Movements of Average Fifth and Seventh Grade Pupils' Reading Materials of Corresponding Difficulty," *Studies in the Psychology of Reading.* University of Michigan Monographs in Education, No. 4, 1-64. (Ann Arbor, Michigan: University of Michigan Press, April 1951.)

Reports the procedures and findings of a carefully planned laboratory study involving 54 pupils each in grades 5 and 6 to test the hypothesis that if material could be found for the poor reader which is just as easy for him as more difficult material is for the good reader, the eye-movements of the two might then be the same.

Morse, William C.; Ballantine, Francis A.; and Dixon, W. Robert. *Studies in the Psychology of Reading.* University of Michigan Monographs in Education, No. 4. (Ann Arbor Michigan: University of Michigan Press, April 1951) 188 p.

Includes three condensed reports of doctoral dissertations prepared at the University of Michigan relating to: the eye-movements of fifth- and seventh-grade pupils when reading materials of corresponding difficulty, age changes in measures of eye-movements in silent reading, and eye-movements in reading of university professors and graduate students.

Morton, John. "The Effects of Context upon Speed of Reading, Eye Movements and Eye-Voice Span," *Quarterly Journal of Experimental Psychology*, 16 (November 1964) 340-54.

Reports rate of reading, eye movements, and eye-voice span recorded for 31 university students as they read eight 200-word passages of statistical approximations at eight different orders.

Nahinsky, Irwin D. "The Influence of Certain Typographical Arrangements upon Span of Visual Comprehension," *Journal of Applied Psychology*, 40 (February 1956) 37-39.

Compares "the span of comprehension" in the case of 30 subjects varying in age from 18 to 39 with three styles of typographical arrangement, namely, "conventional," "spaced-unit," and "square-span" style.

Nodine, Calvin F. and Evans, James D. "Eye Movements of Pre-Readers to Pseudowords Containing Letters of High and Low Confusability," *Perception and Psychophysics,* 6 (July 1969) 39-41.

Examines the scan rate, fixation rate, and fixation times of five girls (aged 5-3 to 5-7 years) and five boys (aged 5-9 and 6-3 years), who had recently completed kindergarten, as they read 20 four-letter pseudoword pairs (half matched letter sequences and half unmatched letter sequences).

Ong, Jin; Schneider, Kenneth; and Moray, Joseph. "Reading Ability and Perimetric Visual Field," *California Journal of Educational Research,* 11 (March 1960) 61-67.

Reports the results of a study involving 155 children, ages about 11, to determine the characteristics of their perimetric peripheral visual fields and to relate the sizes of fields to various factors such as sex, IQ's, power reading, and speed of reading.

Petersen, Raymond P. "Patterns of Eye Movements in Rapid Symbol Identification and Their Relation to Reading Achievement," *Perceptual and Motor Skills,* 28 (February 1969) 307-10.

Analyzes eye movement patterns of 45 third graders to tachistoscopically projected digit and letter patterns and relates reading scores for students from two schools to six eye-movement patterns.

Schmidt, B. "Changing Patterns of Eye Movement Among Students in Reading Classes and Composition-Literature Classes," *The Psychology of Reading Behavior,* G. B. Schick and M. M. May, Eds. Yearbook of the National Reading Conference, 18 (1969) 38-41.

Compares the eye-movement patterns of 153 college freshmen in a reading course and 140 college freshmen in a composition course before and after a semester of instruction and found that even though at the start of instruction eye movements were not significantly different, at the end of instruction the reading group read faster and had fewer fixations and regressions.

Schmidt, Bernard. "Changing Patterns of Eye Movement," *Journal of Reading,* 9 (May 1966) 379-85.

Compares eye-movement patterns, reading rate, and reading comprehension of 190 college students at the beginning and near the end of a 16-week reading improvement course.

Schuster, Donald H.; Karas, George G.; and Antonelli, Douglas C. "Some Normative

Data on Reading Distance," *Perceptual and Motor Skills,* 22 (February 1969) 202.

Presents data concerning reading distance for high school graduates.

Scipione, Alice M. "Eye-Movements as Related to Reading," *The Columbia Optometrist,* 27 (February 1953) 5-8; (May 1953) 3-4.

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