the Required Waites Book

Specific Dyslexia and Other Developmental Problems in Children: A Synopsis

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Contents

Introduction

During the past twenty-five years, a great number of children have been referred for developmental evaluation to Texas Scottish Rite Hospital (a hospital that specializes in orthopedic and neurologic disorders as well as developmental disorders). Diagnoses indicated a range of disorders that are listed in approximate order of frequency as they presented to this hospital.

- Specific Dyslexia
- Specific Learning Disability
- Attention Deficit Disorder
- Slow Learners
- Motor System Disorder
- Oral Language Disorder
- Expressive Writing Disorder
- Primary Mental Retardation
- Dysgraphia
- Dyscalculia
- Pervasive Developmental Disorders

In the chapters that follow we will briefly present the more common disorders to provide information and resources (culled from many years of experience with children diagnosed with developmental problems) to interested professionals and parents of such children.

Specific Dyslexia

Although the occurrence rate in the general population is not known, specific dyslexia ranks high in total number of referrals to the Child Development Division. The medical history of dyslexia, with its unique involvement of written language only, and the continuing interest of many people have made it more appealing to some of us than the other developmental syndromes. For us, the following discussion of specific dyslexia provides the model for the remaining developmental disorders.

Definitions and General Description

Here are three prominent definitions of dyslexia:

1. "Specific Developmental Dyslexia. A disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence, and socio-cultural opportunity. It is dependent upon fundamental cognitive disabilities which are frequently of constitutional disorder" (World Federation of Neurology 1968, 1).
2. "Dyslexia means a disorder of constitutional origin manifested by a difficulty in learning to read, write, or spell, despite conventional instruction, adequate intelligence and socio-cultural opportunity" (Texas State Legislature, Education Code, 1985, Sect. 21.924).

3. Developmental Dyslexia: "A learning disability which initially shows itself by difficulty in learning to read, and later by erratic spelling and by lack of facility in manipulating written as opposed to spoken words. The condition is cognitive in essence, and usually genetically determined. It is not due to intellectual inadequacy or to lack of socio-cultural opportunity, or to faults in the technique of teaching, or to emotional factor, or to any known structural brain-defect. It probably represents a specific maturational defect which tends to lessen as the child grows older, and is capable of considerable improvement, especially when appropriate remedial help is afforded at the earliest opportunity" (Critchley and Critchley 1978, 149).

Specific dyslexia is a disorder involving difficulty with the symbols of written language. By definition, this disability includes basic problems in learning the alphabet and its phonic properties, as well as word recognition, reading, reading comprehension, writing, copying, and spelling. The term "specific" is included in the definition of dyslexia to establish the absence of mental retardation, brain damage, or a primary emotional or mental problem. Family and home environment do not cause specific dyslexia and it is not a result of faulty training in school. Specific dyslexia may be inherited from either side of the family or may occur without any family history. Children with this syndrome usually have no problems in the three-dimensional (everyday) world. Their disability becomes evident with the introduction of abstract symbols, which are the basis of written language.

When a diagnosis of specific dyslexia is given, its relationship to other learning disorders may be confusing. This term refers to a learning disorder involving only written language. Other learning disorders are more complicated and may involve poor attention factors, motor incoordination, behavior problems, and additional symbol systems, such as those used in arithmetic and geography.

Before a diagnosis of specific dyslexia is made in a child who has demonstrated poor written language skills, an extensive history is completed. Complete physical and neurological screening examinations are then done to eliminate these areas as causes of the basic problem. Finally, emotional and mental stability are assessed by testing and observing the child.

Early in the program at Texas Scottish Rite Hospital, Doctor Cliff Wolf completed a research study (1968) that clearly demonstrated the

differences in written language function between children with specific dyslexia and normal controls.

The Neurology of Specific Dyslexia

A review of the pertinent literature regarding the neurology of specific dyslexia suggests that the disorder is a result of uneven maturation (i.e., development) of certain brain functions and is, therefore, a developmental neurological disorder. This concept has been discussed by a number of writers and most elegantly presented by Lauretta Bender (1968):

> Maturation lag signifies slow differentiation in an established pattern. It does not specify that the deficit be local, structural, specific, or fixed. There is no obligatory limitation in potential. . . . The concept of *soft neurologic signs* [emphasis mine] is derived from the work of Paul Schilder and myself. The term applies specifically to neurologic deviations that occur in childhood developmental disorders, maturational lags, childhood schizophrenia, and the developmental dyslexias. It does *not* refer to a mild or borderline neurologic sign. . . . Neurologic patterns remain immature and poorly differentiated, and the longitudinal course shows lags in maturation. . . . There is a specific deficit in symbol formation including auditory, visual, and kinesthetic images and their interrelationships; there is also wide variation in the relative severity of the deficit in each of these areas. . . . Personality immaturity and infantilism are associated with inhibitions, withdrawal, regressions, unorganized "wild" behavior, and dependency (45–46).

In this last paragraph Bender describes the dyslexic child with short attention span and/or hyperactivity, plus the dyslexic child with immature personality trait and social skill development. Of the cases encountered at Texas Scottish Rite Hospital, the ones with these complications and motor incoordination are the most frequent.

Rabinovitch et al. (1954) report three major groups of reading disabilities and their group two is synonymous with specific dyslexia:

> Those with no history or gross clinical finding to suggest neurologic disease but in whom the reading retardation is viewed as primary. The defect appears to be in basic capacity to integrate written material and to associate concepts with symbols. . . . These children are character-

> ized by . . . no evidence of abnormality in the routine neurological examination [and] the presence of certain abnormalities in the expanded neurological examination (366, 377).

Cohn (1961) studied a group of children with difficulties in learning to read and write. After extensive neurological assessment he believes that retardation in development is one of the most appropriate terms for the delayed development of graphic language ability (163). He reports that the normal controls had neurological indices of abnormality due to the presence of "soft" signs (163–164) and concluded:

> Consequently, it appears evident that it is not the "soft" signs as isolated phenomena, but these disturbances in relation to the other biological functions that determine the ability of an individual to operate in an effective, intellectually organized manner (164).

Whitsell (1965) neatly summarizes the early clinical descriptions and neurologic studies of dyslexia in his "Neurologic Aspects of Reading Disorders."

In his foreword to *Developmental Disorders of Motility and Language* (1968) editor Harry Bakwin writes:

> The developmental disorders of motility and language are manifestations of inborn alterations in central organization. No anatomic lesions are demonstrable, nor are there electroencephalographic changes. It is assumed that the basis is a delay or alteration in the maturation of those areas of the brain which govern motor coordination and language (565).

Macdonald Critchley (1961) identifies several deficits found in dyslexic children.

> The principal neurological deficits which may be brought to light by appropriate testing include:
>
> 1. disorders of spatial thought;
> 2. impaired temporal relations;
> 3. inadequate, or inconsistent, or mixed cerebral dominance;
> 4. defects of language other than dyslexia;
> 5. disorders of motility; and
> 6. poor figure-background discrimination.

. . . . Such, however, are in the nature of epiphenomena, and are not integral (472).

Regarding the nature of developmental dyslexia he states:

> To a neurologist, developmental dyslexia—especially when the minor concomitant signs are reckoned with—points clearly to a parieto-occipital dysfunction. This does not necessarily imply gross structural disease (480).

Clinical Description

Specific dyslexia is a primary disorder of reading, reading comprehension, writing, and spelling in an individual with normal intelligence, conventional school instruction, and adequate socio-cultural opportunity. The disorder is constitutional and indicates a disturbance of cognitive functions dealing with the abstract symbols of written language. The word dyslexia, when used without a modifier, indicates a secondary reading deficiency resulting from physical, mental, or environmental influences on an individual. Confusion has arisen because the terms "specific dyslexia" and "dyslexia" have been used interchangeably and the result is muddled thinking in certain medical facilities and several school systems.

The most pervasive quality of specific dyslexia is the difficulty in learning the alphabet and its phonic properties, and retaining this information for immediate recall on a reflex basis. This automatic recall is the basis of learning to read, write, and spell. Consequently, we are dealing with a cognitive breakdown in the storage and/or retrieval of abstract symbols related to written language. The reason for a maturational lag in these functions in some people is not clear.

Specific dyslexia is three times more common in boys than girls. The degrees of severity may be classified as mild, moderate, and severe. The severely disabled children with this disorder probably account for 5 percent of the total number with specific dyslexia. The severe group may show signs and symptoms before formal school training begins. Difficulty in prereading skills is noted with the initial teaching of the alphabet which usually begins in the home. Children with mild to moderate problems are more difficult to recognize before the first grade, especially if their intelligence is above normal.

The history reveals that most of these children do not develop

the usual preschool interest in the alphabet, reading, spelling, and writing. The moderate to severely involved child will avoid anything to do with written language, except listening to adults read to him. Learning the names of the letters is difficult enough, but writing them correctly on paper is even more arduous.

In the primary grades, reading and writing present the major difficulties. The problems become more evident with the introduction of cursive writing in the second or third grade when the change from manuscript printing occurs. An entirely new mode of writing is suddenly required although the dyslexic child has not mastered the old system. Unless special training is provided, reading becomes a continuous struggle. Reading comprehension gradually becomes a difficult factor as the child begins to read for meaning. Spelling is usually the most difficult of the written language skills for the dyslexic child to master. Even with adequate training, the spelling skills do not improve at the same rate as reading, and reading comprehension does not improve at the same rate as reading and writing.

Mirror-image writing, reversals, and translocations of letters and words in reading and writing are frequent. They suggest the child is demonstrating an inability to manipulate abstract symbols in space. He has no obvious problem of orienting his body in space but does have difficulty in placing abstract symbols in proper order and sequence. Many normal children show some reversals and translocations in the early preschool and early school years, but the tendency is not as frequent or prolonged as in children with specific dyslexia. The reversals should disappear by the eighth birthday. If they have not cleared by then, an evaluation should be made as this usually indicates specific dyslexia.

Many moderate to mildly involved children may show more reversals than normal children. It has been an erroneous assumption by the media and by many parents that the appearance of reversals in writing or reading always indicates specific dyslexia. This is simply not true. When the writing reversals persist beyond the eighth birthday without reading and spelling deficiencies, they are probably caused by some disorder other than specific dyslexia. When they persist together, the child probably has specific dyslexia. Frequently, this difficulty with the manipulation of symbols and space is encountered by the dyslexic child in other areas as well, especially in writing numbers.

Most normal children develop the preferred hand for writing by the fifth birthday. Lack of preference by the fifth birthday indicates a

delay in the maturation of this skill. More children with dyslexia are later in establishing this preference than normal children, but this delay does not always indicate dyslexia. The other factors of handedness, footedness, and eyedness are not understood at the present time. More clinical research is required before definitive dogmas are developed relating to dominance, laterality, and reading ability. If the child's preferred hand for writing is not known, exclude vision by asking the child to close his eyes. The preferred hand will most likely become evident with vision excluded. True ambidexterity for writing when vision is excluded is rare.

The study of directionality and spatial orientation in specific dyslexia has been difficult. We believe that a child begins this process by learning his own body parts and their relationship to each other. He then learns directionality of his body as it relates to space, and, later, to objects in space. Finally, he learns the relationship of objects in space to each other. This is the level of difficulty for reversals and translocations in reading, writing, and mirror-image writing.

The child should learn his own right and left body properties by the seventh birthday. He should directly identify the right and left properties of an individual facing him by the ninth birthday. More dyslexic children have difficulty in these functions than normal children. However, the presence of confused directionality and spatial orientation with abstract symbols does not automatically make a diagnosis of specific dyslexia. We suggest that those parents whose preschool age children have reversals, translocations, or mirror-image writing not become unduly concerned unless other symptoms of dealing with the alphabet become evident. If this occurs, the child's prereading skills should be evaluated.

To summarize, we identify the characteristics that are associated with dyslexia (Texas State Board of Education 1986):

- problems in learning the names of the letters of the alphabet
- difficulty in learning to write the alphabet correctly in sequence
- difficulty in learning and remembering the printed word
- reversals of orientation of letters or the sequences of letters
- difficulty in learning to read
- difficulty in reading comprehension
- cramped or illegible handwriting
- repeated spelling errors
- degree of involvement may be mild, moderate, or severe

In addition, the following characteristics **may** be associated with specific dyslexia:

- delay in spoken language
- difficulty in finding the right word when speaking
- late in establishing preferred hand for writing
- late in learning right and left and other directionality components (e.g., up/down, front/behind, over/under, and east/west)
- problems in learning the concept of time and temporal sequencing (e.g., yesterday/tomorrow, days of the week, months of the year, etc.)
- family history of similar problems

Complications

One complication that may be encountered is a short attention span and difficulty paying attention—attention deficit disorder (ADD). ADD may be accompanied by impulsive behavior, distractibility, and hyperactivity. If any of the above problems interfere with training, the child deserves consideration for help with internal controls in the form of medication—under the close supervision of a physician. When the evaluation rules out any emotional problems or environmental influences producing ADD, medication may be indicated to help the patient focus his attention for success in training.

Another complication sometimes present in children with specific dyslexia is motor system disorder. This disorder is manifested by incoordination of gross motor function, fine motor function, alternating movements, and visual motor performance. The child with specific dyslexia complicated by visual motor incoordination has great difficulty with writing. He is usually unable to remember the configuration of the letters which complicates the successful execution of motor activities required in writing.

In addition, many children with specific dyslexia seem to lack the ability for organizing study skills and habits. The lack of organization poses another hazard for the child, as this may be interpreted by his parents and teachers as a lack of interest in and concern for home pursuits and school work. The lament of parents is "he just does not seem to care." The child really does care and is greatly concerned, but this disorganization gives the opposite appearance.

A maturational lag in social behavior is sometimes evident in these children: Some of the symptoms are: associates with younger

children; inept in groups of children; change in routine produces inappropriate responses; perseveration (continuation or recurrence in the absence of a stimulus) of some activities; a low frustration tolerance that alienates peers; and some problems in conforming to rules.

Advice to Parents

Do not let the diagnosis of specific dyslexia intimidate you. The problem is 50 percent resolved with your recognition and acceptance of the difficulty. Your child deserves to be fully informed at his level of understanding, either by you or the doctor. It is your prerogative to determine who is best suited to inform your child.

Accept and tolerate the disorder, and do not be critical as it is no fault of yours and the child is blameless. Clear the frustration and guilt from your thinking and replace them with understanding and support.

Make a list of your child's interests and abilities and develop a strong support program in the areas of his interests and aptitudes. As much effort should go into actions that reinforce the child's abilities as those that attempt to remediate his disabilities. This will keep both you and your child from thinking of him as disabled, and you will realize that he has strengths and weaknesses like anyone else. Do not attempt to do remedial language training as your efforts will not be successful. Your child needs you more as a parent and advocate than as a teacher of reading, writing, and spelling.

Furthermore, do not punish or penalize your child for his difficulty in reading, writing, and spelling. It would be of no benefit to remove privileges because of poor grades when he is making effort. Support your child in group activities where he has a reasonable chance of being successful and receiving positive acclaim. Please do not remove your child from successful sports and group competition because of poor grades that are a result of specific dyslexia.

If your child is not making adequate effort or using specific dyslexia to avoid school work, schedule a group meeting at the school with his teachers to discuss the appropriate action. Always bring your child to the group meetings, as he deserves to be present when his fate is being discussed. These sessions should result in agreements and decisions—not adversity, anger, and indecision.

Do not allow your child to undermine your parental authority because of his diagnosis. He is still a member of your family and

subject to its rules and regulations, and he should be treated and react accordingly. Provide the best remedial language training available in your area to help your child overcome his language disorder and prevent complications. Finally, reading aloud to your child is perhaps the most important activity that you can pursue to stimulate interest in reading and furnish good information at the same time.

Tests and examinations produce more stress and anxiety in individuals with specific dyslexia than in their normal peers. As most school tests are timed and written, it is understandable that the dyslexic child is apprehensive. The time factor alone will cause him to fail. Written tests for students with dyslexia are no more than a crude approximation of the level of their reading, writing, and spelling skills and are certainly not a test of knowledge on the subject or course under consideration. The anxiety and stress of tests and exams may cause a regression in his ability to read, write, and spell, precipitating a return of the reversals and translocations of letters and words during the test. Therefore, these dyslexic students deserve the humane and civilized expediency of untimed oral tests. We should turn our efforts to advocating such exams for dyslexic students in order to give them a chance to achieve reasonable success.

Remedial Language Training

Written language training may be separated into four categories for better insight and understanding:

Developmental The normal acquisition of language

Preventive Preschool and primary grade training

Corrective Special training procedures: usually repetition of classroom curriculum at a slower pace

Remedial Complete retraining procedures

Remedial language training is necessary when the child with specific dyslexia has not responded to conventional methods of instruction and corrective measures. This approach involves a complete restructuring of training, beginning with the alphabet and its phonic properties, and then progressing at an appropriate rate for the child.

The techniques and procedures should be multisensory, structured, and sequential, presented by a kind, firm, and understanding teacher who has been specially trained. Ideally, this training should take place on an individual basis, that is, one teacher with one student. This ratio is almost impossible to obtain, so the next best solution is one teacher and a small group of six or less dyslexic children for each training session. If a specially trained teacher is not available, the dyslexia training program that is available on videotapes is the next best choice. The students should be grouped together according to levels of language disability, age, and current grade placement. The training sessions should occur at a noncritical period in the school day. Attempts at training before or after school are usually not successful. Texas Scottish Rite Hospital provides its remedial language training program in the early afternoon.

The mild to moderately involved child will require approximately 400–600 hours of special training. The severely disabled dyslexic child will require considerably more training time and effort. It is suggested that training begin during the summer, continue for six weeks, and resume with the beginning of school. As long as training is to continue during the school year, further summer involvement is not advisable.

Remember that good remedial language training is tiring and difficult for the child, and he should be rewarded for continued effort and interest. Unfortunately, some dyslexic children find remedial language training so difficult and their progress so slow that they soon lose interest. This is especially true at the junior high school level. When this occurs, an investigation should proceed immediately to determine if the environmental factors are responsible. Usually, loss of interest is not related to external sources. Instead, the child is unable to understand the complexity of his problem and the necessity for extensive training. If the child loses interest and does not understand the explanation, he should be placed on leave of absence from remedial language training at that time, and assured that further help is available if he desires it.

Texas Scottish Rite Hospital Dyslexia Training Program

The Dyslexia Training Program at Texas Scottish Rite Hospital is a modification of the system developed by Doctor Samuel Orton and Anna Gillingham. They were primarily interested in individual train-

ing, and their multisensory program was developed accordingly. We have been interested in modifying and organizing their materials for training dyslexia therapists and children in small groups in the Dyslexia Lab.

Doctor Gilbert Schiffman reported a study in 1966 demonstrating the advantages of this type of remedial training. Aylett Cox has been the prime mover in organizing Anna Gillingham's instruction manual and other materials into a cohesive format that is more acceptable for dyslexia teacher training in our program. Our material was entitled Alphabetic Phonics and has been the core program in this hospital's Dyslexia Lab. Alphabetic Phonics was developed to enable school systems to offer remedial language training individually or in small groups.

An interim research summary of the hospital's dyslexia program was reported in *Remedial Training Programs for Developmental Language Disabilities* (Waites and Cox 1976) and confirmed our belief that there exists within the population of specific dyslexia a group of children who have a severe disability and will remain functionally illiterate in spite of remedial training (see tables I and II).

Table I Test Scores for the Moderately Disabled

	Grade Equivalent Mean		*Standard Deviation*			
Test	*Pre*	*Post*	*Pre*	*Post*	*N*	*T***
Gilmore						
Oral Accuracy	2.42	4.71	1.53	2.07	79	13.33*
Oral Comprehension	3.71	5.92	2.30	2.45	79	7.72*
WRAT						
Word Recognition	3.24	5.43	1.77	2.18	55	16.13*
Spelling	2.70	4.73	1.33	1.50	78	15.59*
Arithmetic	3.31	4.96	1.61	1.96	69	11.79*
Durrell						
Oral Accuracy	2.12	3.56	1.29	1.15	69	11.21*
Silent Accuracy	1.99	3.33	1.26	0.98	65	10.45*
Silent Comprehension	2.10	3.66	1.37	1.15	65	10.47*

*Significance level < .001

**T measures significance of difference pre versus post means

Tables I and II are from *Remedial Training Programs for Developmental Language Disabilities*, Lucius Waites and Aylett R. Cox. Cambridge, MA: Educators Publishing Service, Inc., 1976, 15–16.

Table II Test Scores for the Severely Disabled

Test	Grade Equivalent Mean		Standard Deviation		N	T**
	Pre	*Post*	*Pre*	*Post*		
Gilmore						
Oral Accuracy	2.66	3.53	1.22	1.16	26	5.01*
Oral Comprehension	4.42	5.90	1.53	1.99	26	3.65*
WRAT						
Word Recognition	3.79	5.07	1.41	1.22	17	4.30*
Spelling	3.16	3.73	1.19	1.03	26	2.38*
Arithmetic	3.75	4.73	1.61	2.01	23	3.37*
Durrell						
Oral Accuracy	2.61	3.15	0.88	0.75	19	4.55*
Silent Accuracy	2.38	2.91	0.92	0.60	22	4.19*
Silent Comprehension	2.70	3.73	0.98	0.86	22	6.34*

*Significance level < .001
**T measures significance of difference pre versus post means

Since the initial research, a series of videotapes entitled *Dyslexia Training Program* (Texas Scottish Rite Hospital 1987–1989) has been completed. The tapes were produced primarily for students who had no remedial dyslexia program available nor were likely to have one in the foreseeable future. There are 350 tapes of one hour duration each, which present the phonetic structure of written language in a manner designed for dyslexic students. The material is presented in a multisensory format with a sequential and structured order for reading, writing, and spelling. These tapes do not require a teacher specially trained in dyslexia instruction, but students will do best with a kind, firm, and understanding teacher who is interested in remedial training.

The lessons are divided into Schedules I, II, and III:

> Schedule I covers such concepts as development of spoken and written language; the invention, importance, and sequence of the alphabet; visual and tactile recognition of letter shapes; letter names; diacritical markings and codes; blending sounds; the concepts of vowels and consonants, base words and suffixes, phrases and sentences, regular and irregular spellings, and nouns; and introduces *i*, *t*, *p*, *n*, *s*, *l*, *d*, *f*, *h*, and *a*.

Schedule II continues practice with alphabet sequencing, letter recognition, and base words and suffixes. It also introduces quartiles and use of the dictionary; digraphs; reading printed and cursive writing; syllable division; accenting; punctuation; derivatives; homonyms, synonyms, and antonyms; verbs; rhythmic reading and writing; letter slant and proportion; copying; capital letters; the remaining individual letters of the alphabet; and combinations including *ng, ck, oo, th, ee, ai, ay, er, ir, ur, ar, or, qu,* silent *e, wa, wor, le, dle, fle, tle, ck, ke,* suffixes *-s, -ing, -ed, -er, -ful, -ness, -less, -y, -ly, -est,* and *-en,* trigraph *igh,* and words illustrating particular readings and spellings.

Schedule III continues practice and review of information presented in Schedules I and II, and introduces joined cursive writing of the entire alphabet; diphthongs; prefixes; meanings of affixes; irregular plurals; possessives; sentence and paragraph dictation; and combinations including *ch, ea, oa, oe, au, aw, ue, ie, ph, ei, ey, eu, ew, ti, si, ci, ou, ow, oi, oy, wh, es, tch, eigh, dge, ge, stle, tion, sion, cial, ciant, cious,* and words illustrating additional readings and spellings.

Progress Measures included in the tapes are placed at appropriate intervals to assess mastery of the program.

The published material that accompanies the videotapes is available from Educators Publishing Service, Inc., 75 Moulton St., Cambridge, MA 02138. This material is necessary for full participation of students and their teachers in the program.

Word Processing

A word processing program is a highly desirable alternative for the dyslexic student. It is possible for these students to learn to type three times faster than they are able to write in cursive. Plus, the possibility of correcting mistakes on the monitor screen—rather than erasing on paper—is an advantage of the rapid style of word processing. The addition of software for spelling correction of a manuscript is a joyful addition to the support system for dyslexics because they have the most difficulty with written spelling.

Such a program should begin with teaching the keyboard accurately without looking at the keys and then proceed to touch typing. Computer literacy training is not complete until the student knows the keyboard and can type without looking at the keys. When typing has become reasonably proficient, it is appropriate to teach word processing with a spelling corrector. Students deserve a printer to display work they have done on the word processor.

A Historical Perspective of Specific Dyslexia Presented as a Select Annotated Bibliography

In my opinion the following portrayal of a severe dyslexic is one of the most poignant descriptions in literature.

> It must be a strange state to be like Jo! To shuffle through the streets, unfamiliar with the shapes, and in utter darkness as to the meaning, of those mysterious symbols, so abundant over the shops, and at the corners of streets, and on the doors, and in the windows! To see people read, and to see people write, and to see the postman deliver letters, and not to have the least idea of all that language—to be, to every scrap of it, stone blind and dumb! It must be very puzzling to see the good company going to the churches on Sundays, with their books in their hands, and to think (for perhaps Jo does think, at odd times) what does it all mean, and if it means anything to anybody, how comes it that it means nothing to me? (Charles Dickens, *Bleak House*. 1868, 1985. Bantam Classic, 205.)

1878 "Word blindness" and "word deafness" introduced and described by A. Kussmaul. In von Ziemssen's *Encyclopedia of the Practice of Medicine*, vol. 14, 770–778. London: Sampson Low, Marston, Searle, and Rivington, 1878.

1887 "Wortblindheit (Dyslexie)" appears in R. Berlin's monograph *Eine Besondere art der Wortblindheit*. Wiesbaden, Germany: Bergman, 1887.

1895 "Word-Blindness and Visual Memory" by J. Hinshelwood is the first report in English. Discusses acquired word blindness in adults but does not mention children. The word "congenital" is not in this article. *Lancet* 2 (1895): 1564–1570.

1896 "Congenital Word Blindness" case reported by W. Pringle Morgan in letter of *British Medical Journal* 2 (1896): 1378. Introduction of "congenital" to word blindness.

1897 "Word Blindness" in a boy mentioned in school report of J. Kerr, "School Hygiene in its Mental, Moral, and Physical Aspects." Howard Medal Prize Essay, *Journal Royal Statist Society* 60 (1897): 613–680.

1905 "Congenital Word Blindness" reported by William Evans Bruner, an ophthalmologist of Cleveland, in *Opthalmology* 1, no. 2 (1905): 189–195. First case reported in United States.

1906 Next report in United States by A. Schapringer presented to Section of Ophthalmology, New York Academy of Medicine, 19 February 1906. "American Pioneers in the Topic of Word Blindness" by Lucius Waites in *Historical Aspects of the Neuroscience: A Festschrift for Macdonald Critchley*, ed. Rose and Bynum, 115–116. New York: Raven Press, 1982.

1906 "Types of Congenital Symbol Amblyopia" describes two boys with congenital word blindness by ophthalmologist J. Herbert Claiborne. *Journal of American Medical Association* 47, no. 22 (1906): 1813–1816. Interesting report and discussion.

1906 "Developmental Alexia (congenital word blindness)" by Edward Jackson of Denver in *American Journal of Medical Sciences* 131 (1906): 843–849.

1908 "The Aphasias of Childhood and Educational Hygiene" by C.J. Thomas describes congenital word blindness in some detail (96) and mentions ambidexterity. *Public Health (Transactions of the Society of Medical Offices of Health)* 29 (1908): 90–100.

1917 *Congenital Word-blindness* by J. Hinshelwood. Good bibliography. London: H.K. Lewis, 1917.

1925 "Strephosymbolia" suggested as a more suitable term than congenital word blindness by Orton, who notes that it is not uncommon in school children. *Archives of Neurology and Psychiatry* 14 (1925): 581.

1932 "Some Studies in the Language Functions" is the presidential address of ARNMD by Orton. Reprinted from the Proceedings of the Association for Research in Nervous and Mental Diseases, vol. 13, 1932 in *"Word-Blindness" in School Children and Other Papers on Strephosymbolia by Samuel T. Orton, M.D.*, comp. June Lyday Orton, 147–166. Pomfret, CT: The Orton Society, 1966.

1933 "Special Disability in Writing" by Orton and Gillingham—they are probably describing developmental dysgraphia. *Bulletin of the Neurological Institute of New York* 3, no. 1 (1933): 1–32.

1937 *Reading, Writing and Speech Problems in Children* is a summary of Orton's concepts and experiences with language disabiliity in children. Congenital word blindness, strephosymbolia, and specific reading disability are synonymous terms. New York: Norton, 1937.

1950 *Specific Dyslexia ("Congenital Word Blindness"): A Clinical and Genetic Study* by Bertil Hallgren. The beginning of the change from word blindness to specific dyslexia. A good genetic study suggesting the syndrome follows monohybrid autosomal dominant pattern of genetic inheritance. *Acta Psychiatra et Neurologica Scandinavia*, supp. 65. Ejnar Munksgaard: Copenhagen, 1950.

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1965 "Language Disability: Survey of an Elementary School for Dependent Children of Military Personnel" by Harris C. Faigel. A good study reporting the percent of children with language disability in a school population. *American Journal of Diseases of Children* 110 (1965): 258–264.

1966 Alphabetic Phonics Program. A multisensory, structured, and sequential curriculum for dyslexics evolved at Texas Scottish Rite Hospital and Dean Learning Center. The curriculum was developed by Aylett Cox and the staff of these institutions. It is based upon the work of Doctor Samuel Orton and Anna Gillingham and has been expanded for use in groups of dyslexic students and teacher training.

1966 "Observations on Children with Severe Reading Problems" by Gilbert Schiffman and Raymond L. Clemmens. Clearly defines developmental, corrective, and remedial language training. They suggest remedial training utilizing "multisensory specialized techniques (remedial reading)" and present statistics verifying the suggestion. In *Learning Disorders*, vol. 2, ed. Hellmuth, 297–310. Seattle, WA: Special Child Publications, 1966.

1968 Cliff Wolf evaluated thirty-five children with a definitive diagnosis of specific dyslexia from Texas Scottish Rite Hospital and thirty-five controls. He concluded that there is indeed a measurable difference in the written language functions of dyslexics and that they have considerable more difficulty in reading, writing, and spelling than the normal controls. *A Statistical Study of Specific Dyslexia—Characteristics and Syndrome Patterns*. Ph.D. diss., University of Houston, 1968.

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of the problems of developmental movement and language disorders. Pediatric Clinics of North America, vol. 15, no. 3. Philadelphia: W.B. Saunders Co., 1968.

1968 *Dyslexia—Diagnosis and Treatment of Reading Disorders*, edited by Arthur H. Keeney and Virginia T. Keeney, simply reports the dyslexia conference held in 1966. Springfield, IL: C.V. Mosby Co., 1968.

1968 World Federation of Neurology met at Texas Scottish Rite Hospital and adopted the following definition of developmental dyslexia:

> A disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence, and socio-cultural opportunity. It is dependent upon fundamental cognitive disabilities which are frequently of constitutional origin (1).

World Federation of Neurology. Unpublished report of first meeting, 3–5 April 1968, Texas Scottish Rite Hospital, Dallas, TX.

1972 *Dyslexia—Problems of Reading Disabilities* by Herbert K. Goldberg and Gilbert B. Schiffman represents a good review and current assessment at that time. New York: Grune and Stratton, 1972.

1978 *Dyslexia Defined* by Doctor Macdonald and Eileen Critchley. The third edition (with Mrs. Critchley's assistance) adds the interesting prognostic pentagon (115). London: William Heinemann Medical Publishers, 1978.

1979 *Theory and Research in Dyslexia* by Frank R. Vellutino is a good review of the educational theory and research on the subject at that time. Cambridge, MA: MIT Press, 1979.

1982 "Why Orton Was Right" by Norman Geschwind presents a good discussion justifying a biological research arm of the Orton Dyslexia Society. *Annals of Dyslexia* 32 (1982): 13–30.

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1985 In the journal *Remedial and Special Education*, Isabelle Lieberman and Donald Shankweiler summarize some of their research and state "awareness of the phonological constituents of words—or as it is sometimes called, metalinguistic awareness—is most germane to the acquisition of literacy" (10). "Phonology and the Problems of Learning to Read and Write" 6 (1985): 8–17.

1989 The staff in the Dyslexia Lab at Texas Scottish Rite Hospital completed the two-year video tape recording of the dyslexia remedial training program, entitled Dyslexia Training Program, which is available to all schools. The Dyslexia Training Program is a natural extension of the Orton-Gillingham, Alphabetic Phonics, and Situation Learning systems. A scope and sequence graph for each schedule is being completed from the tapes. It lists each lesson by number plus introduces the new concept and reviews the related reading, writing, and spelling concepts.