

**Dyslexia and Related Disorders in the United States:  
Issues in Assessment and Intervention**

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**Abstract**

The paper first discusses the 1995 working definition of developmental dyslexia. It then elaborates on the reading process as a hierarchy of language performance involving learners' experience, nonverbal cognitive processes, receptive and expressive language, discourse processing and written language. Future directions should emphasize a life span perspective, examine the global and specific problems of underachievement, set goals and priorities and enhance professional preparation. In all these endeavors motivation in literacy learning is also important.

Key words: Dyslexia; Learning disabilities; Reading as a language hierarchy; Future directions in research and practice

Thank you very much for inviting me to participate in this Hong Kong summit on dyslexia and related learning disorders. I commend your efforts to enhance the quality of life for children with special needs. Your multidisciplinary efforts are particularly noteworthy. Equally noteworthy is the excellent *Primer in Common Disabilities* edited by Mak, Lam, Ho and Wong (2006).<sup>1</sup> All of the chapters provide diagnosticians with useful, scientifically-based information.

I have been asked to address some issues related to the assessment and intervention of dyslexia in the U.S., but first it is necessary to consider dyslexia in the context of the broader population of children with learning disabilities. The U.S. public school systems typically classify children according to broad categories such as sensory impairments, cognitive disability (or mental

impairment), physical handicaps, behavior disorders, and learning disabilities. There is no category for dyslexia per se. Prior to the late 1960's there were no special education services for the heterogeneous population now classified as learning disabled. Consequently, many children remained in the regular classroom or dropped out of school. Others were in state or local institutions and were sometimes classified as brain damaged, aphasic, dyslexic, and other terms, depending upon the primary problems. Many terms were medically based, a concept that some educators questioned. Therefore, professionals sought a term that was more educational in nature and that encompassed several subgroups. Thus, the term learning disabilities was adopted and is defined in the Federal Register, 1977.<sup>2</sup>

“...a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do math calculations. Term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems that are primarily the results of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.”

Many people have expressed concerns about this definition because of the exclusionary nature and the focus on processing disorders, but the greatest problems arose with the criteria for classification. Many schools classify children if they have a discrepancy between mental ability and achievement. This practice resulted in considerable controversy, particularly with the measurement of I.Q. and the size of the discrepancy. Yet, the term learning disability is still used in most schools in the U.S. Hence, children with specific reading disorders or dyslexia are included in that population.

The term dyslexia is used occasionally in public schools, but more often, it is used in private schools and clinics, by some neuropsychologists, and medical teams. Like other handicapping conditions, dyslexia has been defined in various ways. Sometimes it is defined broadly as a reading disability that is not due to intellectual, sensory, motivational, or environmental factors,

but is of constitutional origin. Such definitions have been criticized because they are too broad (Lyon 1995). Therefore, some professional groups have defined dyslexia as a word recognition problem in order to differentiate it from global reading problems.

The working definition of the Orton Dyslexia Society (now the International Dyslexia Association) Research Committee is provided below (Lyon, 1995, p. 9).<sup>3</sup>

“Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalized developmental disability or sensory impairment. Dyslexia is manifest by variable difficulty with different forms of language, often including, in addition to problems with reading, a conspicuous problem with acquiring proficiency in writing and spelling.”

This definition is used by many researchers; however, as with other terms, criteria for diagnosis vary. Diagnosticians need to make decisions about levels of severity, types of tests, and many other factors. Furthermore, when planning for student needs, it is important to recognize that many problems co-occur. Some, but not all, dyslexics have problems with oral syntax, morphology, with reasoning, visual processing, and visual-motor integration, any one of which might interfere with reading or writing. Therefore, it is my impression that an evaluation should include more than word recognition and phonological processes (Johnson, 1995).<sup>4</sup>

Many clinics in the U.S. use the definition of Reading Disorder and criteria from the Diagnostic and Statistical Manual of Mental Disorder (4<sup>th</sup> edition, 1994).<sup>5</sup> That definition is broader than the previously cited definition of dyslexia because it includes both word recognition and comprehension.

### Definition of Reading

The dictionary has two basic definitions for reading. The first states that “reading is the process of converting print to speech” whereas the second is “apprehending meaning from print.” Thus,

one's definition of reading influences the selection of tests, the interpretation of results, and plans for intervention. The first definition is related primarily to word recognition and decoding, much like the research definition of dyslexia, whereas the second focuses on meaning which should be the goal of all reading. While word recognition is often the best predictor of reading comprehension in the early grades, this is not the case across the age range. Chall, Jacobs, and Baldwin (1990) reported that children in the fifth and sixth grades (about 10-12 years of age) use context and background knowledge to predict words in context.<sup>6</sup> Thus, their reading of single words is sometimes lower than contextual reading. Many adolescents and adults have significant reading comprehension problems without word recognition difficulty.

### **Reading: A Second Order Symbol System**

In literate cultures, children first acquire oral language and then learn to read and write. Thus, reading is considered a second order symbol system. Whenever students have problems learning to read or write, it is necessary to determine whether they have underlying cognitive, listening or expressive language problems. In our clinic evaluations we use the language hierarchy outlined below.

The lowest level on the hierarchy is Experience. Thus, information is obtained about the student's background, stimulation, literacy experiences, and other factors. Some poor readers perform poorly, not because of an intrinsic or constitutional problem, but because of experiential limitations. Many schools in the U.S. now provide early literacy instruction for such children so they will be more ready for first grade. In addition, many schools now focus on Response to Intervention before classifying children.

The second level on the hierarchy is Nonverbal Cognitive Processes. At this level, we are interested in knowing how children abstract, perceive, remember, and categorize various types of nonlinguistic information. The diagnostic question is – “does the student acquire knowledge from observing and from acting upon objects in the environment”?. Failure to integrate

background knowledge may interfere with oral language, reading, writing, mathematics, and other symbol systems

The next level is Oral Receptive Language (listening comprehension). This is the first symbol system children acquire and it usually begins at about nine months of age. It includes comprehension of words, sentences, and discourse. Children with problems at this level typically have difficulty with higher levels of language including reading. Some, however, are good decoders/poor comprehenders. Thus, reading evaluations should include measures of listening comprehension. Research findings indicate that listening comprehension is better than reading comprehension up to about age 9 or 10, after which reading is higher. Some researchers who oppose the use of I.Q. tests look for a discrepancy between listening comprehension and reading. This practice is reasonable if listening is intact; however, when oral comprehension is problematic, a test of nonverbal cognitive ability may be needed. Evaluations of listening are crucial for students in secondary schools and universities if tape recorded texts are recommended as accommodations.

Oral Expressive Language follows listening comprehension and usually begins at about one year, but like listening, development continues throughout life, particularly in vocabulary, complex syntax, and morphology. While many studies of dyslexics reveal problems in phonological processing skills such as non-word repetition and word retrieval fluency, others found that some poor readers have problems with syntax and morphology as well. Furthermore, some children with oral expressive language problems read better silently than orally. When children are asked to read aloud, both speech and reading are required. Therefore, any child with speech and language problems should be studied very carefully.

The need for a comprehensive oral language evaluation is highlighted in Anderson et al (1985) in *A nation of readers: The report of the commission on reading*.<sup>7</sup>

“Reading must be seen as part of a child’s general language development and

not as a discrete skill isolated from listening, speaking, and writing. Reading instruction builds especially on oral language. If this foundation is weak, progress in reading will be slow and uncertain (p. 30).”

The next level on the language hierarchy is Reading, which is a form of visual receptive language. Our evaluations include single word reading, oral reading of context, comprehension of words, sentences, and passages, both timed and untimed.

Word recognition skills are usually assessed with standardized tests of oral reading. Typically, words in these tests are selected according to frequency of occurrence rather than specific patterns or phonics rules. Hence, more criterion reference tests or experimental measures may be needed.

Many researchers and clinicians measure word attack skills (i.e. reading of non-words). These procedures have been used for many years and have been found to discriminate dyslexic readers from other poor readers. However, an analysis of individual students indicates that some can read real words at an expected level, but not non-words.

Oral reading of various types of discourse is included in the evaluation because studies reveal that some children read certain words in context more accurately than in lists. This is especially evident on high frequency, non-phonetic English words such as “where, which, and there.” and because children use their background knowledge and language skills to predict words. Even though instruction may be needed at the level of the word, students should have an opportunity to read texts to gain confidence and realize that they can, indeed, read.

Although current definitions of dyslexia tend to emphasize word recognition, all reading evaluations should include tests for comprehension of words, sentences, and various types of discourse such as narratives, exposition, and even mathematics, since the goal of all reading is to understand the material. When choosing texts for comprehension, diagnosticians should

consider modes of responses that are required. Some tests require a marking response (e.g., matching words to pictures, or circling the correct answer). Other tests require oral responses in which case a student may perform poorly for reasons other than reading per se. If students are asked to respond after the text is removed, more working memory is needed. Each format places a different cognitive demand upon the student. Therefore, comparisons among tasks yield useful diagnostic information.

As stated above, reading comprehension should be compared with performance of tests for reasoning and listening comprehension to try to determine the source of the weakness. In the early grades, listening comprehension typically exceeds reading comprehension, but after word recognition improves, reading comprehension is often better than listening because of the auditory memory demands on listening.

The highest level on the hierarchy is Written Language, which is a form of visual expressive language. By the time students reach this level they have two systems for receptive language (i.e., listening and reading) and two systems for expressing ideas (i.e. speaking and writing). A comprehensive evaluation of written language includes an assessment of narratives and expository discourse as well as tests for spelling and grammar. From our perspective, students with suspected reading disorders need a comprehensive evaluation at all levels on the hierarchy in order to plan intervention.

### **Factors to Consider in Future Studies**

#### **A Life Span Perspective**

Because students with learning disabilities are a heterogeneous population, the age at which they are identified varies. Those with severe receptive or expressive language problems, as well as those with severe perceptual-motor problems, may be identified in the preschool years, whereas those with specific reading and writing problems may not be identified until they have been in school and failed. Johnson and Blalock (1987) reported that 10% of the adults in their clinic

group had been identified before school entrance, and an additional 35% by the end of first grade. Students with mild written language disorders may not be detected until the third grade or later.

Considerable emphasis has been given to identification of high risk children during early childhood in the U.S., but all schools, including universities, need to be prepared to meet the needs of dyslexics and other students with special needs across grade levels. Generally, intervention includes direct work on the problems as well as accommodations. For example, dyslexics need to be taught how to read, but they may also need accommodations such as (1) extended time, (2) tape recorded texts or a reader (3) alternative forms of examinations, (4) course substitutions (in the case of foreign languages), (5) location of examinations if students are distractible in large classes, and other modifications as needed. These accommodations are essential for university students who have good ability, but who may be unable to take examinations in the traditional form.

### Breadth and Severity of Problem

The number of areas of underachievement as well as the severity vary in this population. Students with relatively global problems may perform below expectancy in all areas of achievement, whereas others have specific problems. Thus, some students have mild, moderate, or severe specific problems, while others have mild, moderate, or severe global problems.

### Goals and Priorities

Because many students have multiple problems, teachers must decide whether to help students acquire knowledge in the content areas, irrespective of reading and writing level, or to continue working on basic skills. Ideally, we hope that both can be accomplished. We also hope that early intervention will foster competence so students can “read to learn” and write well enough to convey what they know. However, because problems persist (albeit progress is reported), special educators, parents, and regular educators are faced with the dilemma of how to help students master both content and reading skills. These questions are relevant for both academic



and occupational goals.

### Professional Preparation

In order to meet the educational needs of dyslexics and other exceptional learners, extensive pre-service and continuing education is needed. Teachers need a strong understanding of their own language in order to teach it (Moats, 1994).<sup>9</sup> They need metalinguistic knowledge to understand how print is mapped on to oral language rules including phonology, morphology, syntax, semantics, and pragmatics. In many schools, teachers are also expected to use evidence based practices so they can translate research findings into practice. Thus, they need to learn how to incorporate skills such as phonemic awareness, decoding, and fluency in their practice.

According to the National Reading Panel and the National Institute of Health, the essential components of effective reading programs include: (1) Phonemic awareness, (2) Phonics, (3) Reading fluency, (4) Vocabulary, and (5) Reading comprehension. Teachers should also have course work in both oral and written language.<sup>10</sup>

In the U.S., teachers are expected to do ongoing progress monitoring. Hence, they need mentoring to develop the necessary skills to evaluate the impact of their instruction. Recent reports from the U.S. Department of Education indicate that some young children who have been in federally funded early reading programs are not making adequate progress in comprehension. This has been my concern because of the emphasis given to oral reading and fluency. Hence, it is my impression that all diagnostic and intervention plans include word recognition, context and comprehension.

### Summary

Finally, motivation to read and write cannot be ignored. In a recent book, "Is literacy enough?" Snow et al (2007) found that some students had good academic skills, but they struggled in school or dropped out.<sup>11</sup> They concluded that many factors including family and social factors contribute to successful outcomes. Hence, the whole child in social context should be the focus

of both assessment and intervention. Harmon (1987) made similar points some years ago.<sup>12</sup> He said that levels of reading ability are not static. Some students regress after leaving school whereas others continue to make progress with broader experiences and motivation. He added that reading is more than a functional or vocational tool. Rather, it is valuable as a means of self-fulfillment and enrichment.

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