

Diagnosing Reading Disabilities at a Graduate School Level

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Abstract

Reading disability is the most common learning disability. While reading disabilities are commonly diagnosed by the fourth grade, symptoms of a well-disguised reading difficulty may manifest during graduate school, when more complex reading and writing skills are required. We report on a medical student reporting increased difficulty with academic tasks and review the process typically used in identifying individuals in graduate school with a reading disability.

Key Words: Reading disability, dyslexia, academic accommodations

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Background

Reading disability* is the most common learning disability. More than 80% of those identified as learning disabled have a reading disability,¹ and the prevalence of reading problems in the general population ranges from 3%-20%.² It is believed that individuals with reading difficulties “possess the intelligence and motivation considered necessary for accurate and fluent reading”³ but have a fundamental deficit in the ability to translate individual letters and letter combinations into sounds; this is known as phonologic awareness⁴. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM IV), three main criteria are considered in the diagnosis of a Reading Disorder⁵:

- “Criteria A: The essential feature of Reading Disorder is reading achievement (i.e., reading accuracy, speed, or comprehension as measured by individually administered standardized tests) that falls substantially below that expected given the individual’s chronological age, measured intelligence, and age-appropriate education.
- Criteria B: The disturbance in reading significantly interferes with academic achievement or with activities of daily living that require reading skills.
- Criteria C: If a sensory deficit is present, the reading difficulties are in excess of those usually associated with it.”

An evaluation of a student’s medical, developmental and family history is necessary to determine risk factors for a reading disability and to rule out secondary forms of reading difficulties. While genetic conditions⁶, traumatic brain injury⁶, low birth weight⁷, visual, hearing or motor disorders and mental retardation can lead to learning difficulties (and thus reading difficulties) and need to be identified and addressed, they are not included in the federal definition of learning disabilities⁸. Along with personal medical and developmental history, family history is also important to consider. Individuals with a family history of language, speech or reading difficulties are at a higher risk of developing reading difficulties, with more prevalence among first-degree biological relatives⁵. There is

*The terms “reading disability” and “dyslexia” are often used interchangeably in the literature.¹⁵

an approximately 60% concordance of phonologic deficiency between identical twins⁹. Furthermore, 23%-65% of children with a parent who has a reading disability will also have a reading disability¹⁰.

Although a medical examination may reveal signs of neuro-developmental delays, the neurologic examination of an individual with reading disabilities is usually normal¹¹. This may be because other factors can also contribute to reading difficulties. Environmental factors such as poverty, an understimulating home environment, low parental education and inadequate instruction play a role in reading and are important to examine. Early identification of and intervention for children with reading disabilities is beneficial, and the prognosis is good in a significant percentage of cases¹². Remediation, such as providing highly structured, intense, individualized instruction emphasizing phonologic awareness and phonics instruction, is crucial in early childhood.

While many individuals with reading disabilities are diagnosed by the fourth grade, well-disguised reading difficulty can become more noticeable, severe and debilitating in graduate school. As more complex reading and writing skills are required, and the demands for greater accuracy and speed of decoding increase, symptoms of reading disabilities can manifest. For older students, accommodations such as test accommodations (extra time for reading, reader, scribe, distraction-reduced test-taking environment), tape recorders in the classroom, alternative textbooks and instruction in word processing are helpful.

As optometrists and educators, it is important for us to better understand how individuals with reading disabilities, particularly those in a graduate level setting, are diagnosed and what resources and accommodations are available to facilitate their success. Furthermore, because of the changing dynamics of our educational system, such as fairer exam provisions and increased academic support, there has been a rise in the number of students with reading disabilities in higher education¹³. In the United Kingdom, the number of students in higher education with dyslexia increased from 0.74% in 1994 to 1.00% in 1996¹⁴. It is important for optometrists and educators to be

knowledgeable about reading disabilities. We report on a case of a student in medical school that was self-referred for an assessment of learning difficulties.

Case Report

A self-referred 26-year-old Asian American male medical student presented to the Accommodations and Resource Center (AARC) at the Harris Family Center for Disability and Health Policy at Western University of Health Sciences requesting an assessment of learning difficulties. He reports that he is an excellent student and denied any special courses or instruction prior to graduate school. However, since his entry into graduate school he has had to request assistance from professors to develop memory strategies and worries that tutors have not been able to adequately address his concerns. He also explains that he often goes more in-depth than necessary when studying and feels he needs to know everything to feel confident. By report from the individual and his family, his medical history is nonsignificant with no history of injury, trauma or atypical illness. He attained developmental milestones at the expected stages and he grew up in an intact middle-to-upper-middle class English-speaking community.

At the Neuropsychological Assessment, the student completed the Wechsler Adult Intelligence Scale – Fourth Edition (WAIS IV) and Nelson Denny Reading Test (NDRT). The WAIS IV indicated his current level of intellectual functioning in the average range. His Verbal Comprehension Index score was recorded and demonstrated performance in the High Average range. However, on the NDRT, his performance ranged from Borderline to Average. His NDRT Reading Rate and Comprehension were in the Borderline range, more than two standard deviations and more than one-and-one half standard deviations, respectively, below his overall intellectual functioning, both significant differences. In contrast, his NDRT Vocabulary score was in the Average range, somewhat below expectation.

Based on this difference between his Average aptitude scores (and High Average score in the Visual Comprehension Index) and noncorresponding Below Average achievement scores with a negative medical, developmental and environmental history, a diagnosis of reading

disability was given. To accommodate his reading disorder the student was provided with double time for exams, audiotaping of lectures, note-taker or provision of class notes and, whenever possible, early access to course material.

Discussion

Reading disability is a complex problem that requires early diagnosis, educational intervention and appropriate accommodations. Educators should be knowledgeable about signs of reading disability in their students. Signs of a reading disability in an adult individual include:

- deficits in reading comprehension
- low reading speed and accuracy
- difficulty with note-taking
- trouble organizing essays and expressing ideas in writing
- problems with spelling and grammar.¹⁶

Other behavioral signs to look out for include problems with:

- short term memory
- concentration
- distinguishing right from left
- self-organization
- visual perception.¹³

These signs may be particularly indicative of a reading disability if seen in an individual who excels in other academic areas such as math. Some students with a reading disorder may have been misidentified as lazy when in fact may be working harder than their peers to overcome obstacles and obtain the same grades.

If an otherwise normal student is suspected of suffering from a reading disorder, academic support such as tutoring and study skills instruction, including, for example, effective note-taking, essay planning, exam revision, referencing and time management, may be good first steps. At our institution, students suspected of having a learning disability such as a reading disorder may be referred to either AARC or our Learning Enhancement and Academic Development (LEAD) office. The LEAD Office focuses on providing academic-based counseling, tutoring services and skill development directed at time management, critical thinking, test taking

strategies and stress management techniques.¹⁷

If such support does not improve academic performance despite earnest effort, LEAD refers students to the Assistant Director of AARC for further determination of their needs (i.e., learning disability evaluation). During the initial evaluation with a psychologist, focus is placed on ensuring that the student has had a stable medical, developmental, environmental and academic background. As such, a thorough case history with the student is conducted through a structured interview and/or questionnaire and referral(s) to a neurologist and/or other specialists may be requested if appropriate. A review of old transcripts, classroom observation and a review of prior remediation strategies may also be performed.

If academic counseling and additional educational support do not fully resolve the student's reading difficulties, and a thorough history to rule out secondary causes of a reading disability such as medical, developmental and environmental causes comes back negative, testing is necessary to identify individuals with a reading disability. According to the traditional definition of learning disabilities, a learning disability is a diagnosis given to otherwise normal individuals with at least average intelligence who have achievement deficits¹⁸. Thus, diagnosis of any learning disability typically starts with a measure of ability or aptitude.

Aptitude measures ensure that the person has the basic cognitive ability to be able to perform. Common tests used to evaluate general intelligence functioning include the Wechsler Intelligence Scale for Children, WAIS, Woodcock-Johnson and Stanford-Binet¹⁹. In our case above, aptitude was evaluated using the WAIS IV. In evaluating students for a possible reading disorder, focus is often placed on the Verbal Comprehension Index score of the WAIS because it is considered a more accurate representation of reading function.

Once we establish that the person is of at least average intelligence, we look for a discrepancy between aptitude and achievement scores. Achievement is quantified by performance on specific educational tests. If an individual's achievement scores are significantly lower than we would expect based on

aptitude testing, a disability is suspected. Three commonly used achievement tests are the Woodcock-Johnson, NDRT and Wechsler Individual Achievement Test (WIAT). The Woodcock-Johnson is commonly used because it has co-normed tests for measurements of aptitude and achievement. The WIAT, a nationally standardized, comprehensive achievement test, is often used because it is co-normed with the WAIS and thus allows comparison of both scores. Findings of a deficit between aptitude and achievement are supplemented and supported with results from below-average results on the NDRT, which is the most widely used reading test in education²⁰.

Additional assessment tests may be used to diagnose patients with a reading disability, such as tests that evaluate oral language skills. Specific oral language skills are evaluated within two main categories: higher level language skills and auditory processing/phonological awareness¹⁹. Educational testing within the realms of word reading and decoding, fluency, reading comprehension, spelling, written expression and handwriting may also be elements included in assessment. Common tests for evaluating adult individuals with reading difficulties are outlined in Table 1. It may be more difficult to detect a read-

**Table 1
Commonly Used Tests for Evaluating Adult Individuals with Reading Disability**

Test	Ages	Screening Parameters	Notes
General Intelligence Functioning(19): Measures aptitude; what is this person's capacity? Would he/she have the capability to perform at a higher level without a learning disability?			
Wechsler Adult Intelligence Scale Fourth Edition (WAIS IV): Similarities, block design, digit span, digit symbol	16 years and older	Global IQ, Verbal IQ, Performance IQ	Expected IQ of at least 85 in dyslexic individuals(22); co-normed with the WIAT
Stanford-Binet	2-23 years	Fluid reasoning, knowledge, quantitative reasoning, visual-spatial processing, working memory	
Sample of Educational Tests: Measures achievement; at what level is this person actually performing?			
Wechsler Individual Achievement Test (WIAT)	4-86 years	Basic reading, reading comprehension, math calculations, math reasoning, written expression, oral expression, listening comprehension	Co-normed with the WAIS
Nelson Denny Reading Test	9-16 years, adult	Vocabulary, comprehension and reading rate	
Gray Oral Reading Test: Passage reading	6-18 years	Oral reading skills (pronunciation, fluency, comprehension, reading rate)	Expected less than or equal to 82 in dyslexic individuals(22)
Wide Range Achievement Test (WRAT): Word reading, spelling	5-11 years, 12 years and older	Reading (recognizing and naming letters and words), spelling (writing symbols, names and words)	Expected less than or equal to 82 in dyslexic individuals(22)
Woodcock Reading Mastery Tests	5 years and older	Individual strengths and weaknesses in reading skills; word reading and decoding, reading comprehension	
Informal Reading Inventories (e.g., Bader Reading and Language Inventory, Ekwall/Shanker Reading Inventory)	Varied	Spelling, handwriting	
General Intelligence Functioning and Educational Tests			
Woodcock-Johnson	2-90+ years	Comprehension-knowledge, fluid reasoning, processing speed	Can measure both aptitude and achievement
Oral Language Skills(19)			
Clinical Evaluation of Language Fundamentals	5-21 years	Higher-level language skills	
Comprehensive Assessment of Spoken Language Test of Language Development: Primary or Intermediate Test of Adolescent and Adult Language	3-21 years	Higher-level language skills	
Comprehensive Test of Phonological Processing	5-24 years	Auditory processing/phonological awareness (phonologic awareness, phonologic memory, rapid naming, rhyming words and decoding skills)	

ing disability in older students because they may have developed compensatory skills and techniques. Furthermore, test norms may be limited to adolescents.

The student described in our case report was diagnosed with a reading disability because he presents with a negative medical, behavioral and environmental history, has difficulties persisting despite academic-based counseling, tutoring services and skill-building, and demonstrates adequate cognitive abilities (as identified through aptitude testing) but significantly lower performance in reading (as identified through achievement testing). A deficit of one-and-a-half standard deviations is considered a meaningful difference²¹. Notably, it is possible to diagnose a learning disability in an individual with below-average intelligence, but it is often difficult to find a significant difference between aptitude and achievement.

Academic accommodations allowed this student to better develop strengths to work through limitations from his disability. Besides allowing additional time for exams, audiotaping of lectures, note-taker or provision of class notes and, whenever possible, early access to course material, other resources exist to assist students with reading disabilities. Technologies such as ReadPlease and TextHELP software allow students to simultaneously hear and see text on their computer. More sophisticated software, such as Kurzweil 3000, allows printed material to be scanned and read aloud by the computer. Recordings for the Blind and Dyslexic, which is a library that provides audio recorded textbooks, is also a commonly used and often helpful resource. Readers for exams and alternative text are other academic accommodations designed to ensure equal access in the classroom. Specialized instruction may also be recommended to help the student learn skills that tap into natural strengths in order to compensate for areas of weakness.

While individual accommodations are important, support from educators is necessary to facilitate optimal student learning. As students with a reading disorder may read slower and with more difficulty than their peers due to difficulties with phonological processing, it is important for educators to avoid putting such students in a situ-

ation where this may be highlighted, such as asking the student to read text aloud in class. Other considerations to facilitate academic success for students with a reading disability include providing high-contrast course materials, avoiding putting too much information on one page, writing in shorter, simpler sentences, avoiding fancy, particularly italicized, fonts (12+ sans serif fonts such as Arial are preferred) and considering offering oral assessment opportunities¹³. Multimodal presentation and rehearsal of material to facilitate retention of new information, including use of different or novel presentation formats, may also be helpful.

While individuals with a reading disability may need more time to process and understand written material, they can still proficiently perform in environments with high reading and writing demands, such as within the healthcare profession. Recent study results indicate that degree classifications achieved by students with reading disorders were not significantly different from those of other students¹³. Additional workplace support, such as proofreading by colleagues, typing by administrative staff and using dictation software, may be advisable. Most employers are legally required to make such reasonable accommodations.

Conclusion

Reading disabilities are typically diagnosed by the fourth grade, but well-disguised reading difficulties may manifest in graduate school as reading and writing tasks become more complex. An evaluation to rule out medical, developmental and environmental conditions that can lead to secondary forms of reading difficulties is important, and academic-based counseling, tutoring services and academic skill-building need to be considered. If such resources do not fully resolve reading difficulties, testing administered by a trained professional is necessary to identify individuals with a reading disability.

Testing to diagnose a learning disability, such as a reading disability, typically focuses on ensuring that the otherwise normal individual has at least average intelligence (aptitude) but has achievement scores that are below expected levels. If such a deficit is found within

reading, a reading disability diagnosis is appropriate, and accommodations should be provided to support the student. Individualized accommodations are essential to the success of the student's academic career and ensure students receive resources specific for their own unique circumstances. Optometrists and educators alike need to be aware of the signs of reading disability, how reading disability is diagnosed and what resources and accommodations are available to allow equal access in the classroom and thus facilitate success.

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