

Specific Learning Disabilities: Plural, Definable, Diagnosable, and Treatable

The passage of PL 94-142 in 1975 legislated that children with educational handicapping conditions were guaranteed the right to a free and appropriate public education (FAPE). Unfortunately, it did not define what the specific kinds of learning disabilities are and what effective instructional approaches recommended for each are. Rather, the legally mandated criteria have been based on eligibility for services under the umbrella category of learning disabilities rather than nature of instruction needed for a specific diagnosis.

Another unfortunate consequence of a purely legal solution to obtaining FAPE has been that state level implementation of federal special education laws has been driven by legal and accounting policies rather than by best professional practices of teachers and the whole team of educational professionals and school administrators. Regrettably, there is policy to hold teachers accountable without granting professional autonomy to tailor instruction to the developmental and individual differences of their students. See Berninger (2015).

At the same time, federally supported research, in large part the result of the 1989 Interagency Report to Congress, has made substantial progress in defining specific kinds of learning disabilities and in identifying effective treatments for them during the K to 12 school years. To begin with, research shows that not all writing disabilities are dysgraphia, not all reading disabilities are dyslexia, and not all math disabilities are dyscalculia. Furthermore, dysgraphia, dyslexia, and dyscalculia can be defined and appropriate instruction for them can be given. To take that a step further, we can also identify oral and written language learning disability (OWL LD), which is often confused with dyslexia. Let's look at the definitions of each disability and explain the instructional approach for teaching the associated impaired skill/s.

Dysgraphia is a word of Greek origin that means the condition of (-ia) having impaired (dys) graph (letter) production. Individuals with dysgraphia have unusual difficulty with letter formation—producing legible letters others can recognize and doing so automatically in a consistent way that does not drain limited working memory resources. These handwriting problems can occur in students who can read without difficulty, but the impaired handwriting may interfere with their spelling and composing. Other children have developmental motor disorder that interferes with a variety of fine (small) and/or gross (large) motor skills. These children may have difficulty with handwriting, too, but for different reasons, which require different instructional approaches. To teach students with dysgraphia, teach them the sequence of the component strokes needed to form an individual letter, a unit of written language. That is, teach them more than just motor skills—teach language skills—finding, retrieving, and producing letters, a unit of language smaller than the word.

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For further information on diagnosing and treating dysgraphia, see Berninger (2012, 2013, 2015; Berninger & Niedo, 2014; Berninger & Wolf, 2009a, 2009b, 2012; Wolf, 2011).

Dyslexia is also a word of Greek origin that means the condition of (-ia) having impaired (dys) lexicon (word) skills. As often happens when a suffix is added to a base word in English, the spelling of the base word is transformed—in this case lexicon is shortened to lex. In kindergarten children at risk for dyslexia struggle compared to other children in naming letters, writing letters, and associating sounds with letters. Throughout the early grades, they struggle with oral reading. In some cases both accuracy and rate of oral reading are impaired, but in other cases only rate of oral reading is impaired in dyslexia. They have more difficulty recognizing words on lists without sentence context than in sentences. They tend to have considerable difficulty in orally reading “fake” words that are pronounceable in English but have no meaning, like the Jabberwocky words in *Alice in Wonderland*. After the fourth grade transition to silent reading, significant problems in silent word reading and written spelling are typically observed, but oral reading problems may persist, too.

Some, but not all, individuals with dyslexia may also have dysgraphia. If so, use treatment approach described under dysgraphia. Teaching them to overcome dyslexia will require explicit, systematic, structured instruction in decoding unfamiliar words, recognizing familiar words automatically, and spelling words (see Berninger & Fayol, 2008; Berninger & Niedo, 2014). This instruction in word reading and spelling skills is needed beginning in first grade, continuing through middle school, and sometimes even in high school. Because English is a morphophonemic orthography (see Henry, 2010; Nunes & Bryant, 2009), phonics instruction in correspondences between a grapheme (one or more letters) and a phoneme (sound) is necessary, but not sufficient. Instruction in morphology—how prefixes are added to the beginning of base words to shade meaning or to the end of words to mark number (singular or plural), tense (present or past), or changing part of speech (for example, nouns into verbs, adjectives, adverbs etc.)—is also necessary. The puzzle is that individuals with dyslexia often have amazing skill at learning language by ear through listening and language by mouth through expressing ideas orally, both of which involve units of language larger than a word. See Berninger (2015), Berninger and Wolf (2009a, 2009b, and forthcoming).

That is not the case for students with oral and written language learning disability (OWL LD), which impairs units of language larger than the single word. The oral language problems are first noted during the preschool years when children are slower at saying their first words, combining words, and finding words to express themselves. The written language problems are observed during the school years when these students tend to struggle with reading and writing sentences and text. Language is not a single system; rather, language partners with sensory input through ears and eyes and motor output through mouths and hands. Children show individual differences in the rates and ways in which the four language systems develop and learn to work together. Children with OWL LD often develop problems in listening comprehension (language by ear), oral expression (language by mouth), reading comprehension (language by eye), and/or written expression (language by hand). Unfortunately, children with OWL LD are often not identified or are misdiagnosed as having dyslexia. Consequently, they do not receive appropriate instruction. Like all children they need instruction in handwriting, word decoding, and spelling, but in addition they need specialized instruction in listening comprehension, reading comprehension, oral expression, and

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written expression. See Arfé, Dockrell, and Berninger (2015). If their reading program focuses only on decoding “fake” words and not reading comprehension, students with OWL LD tend to have significant impairment in reading real words and understanding the sentence and texts they read. Students with OWL LD require explicit, systematic, structured, and sequential instruction in processing and producing language involving multiple words in clauses, paragraphs, and longer texts. See Berninger (2015) and Silliman and Berninger (2011).

Dyscalculia, yet another word of Greek origin, refers to impaired (-dys) condition (-ia) of calculation (computational procedures for the basic addition, subtraction, multiplication, and division operations). Students with dyscalculia may or may not be impaired in all quantitative skills or the visual-spatial skills involved in math learning. Math is also not a single, homogeneous function. Longitudinal studies showed that there are quantitative (number) skills, visual spatial skills, and language skills contributing to math learning (Robinson, Abbott, Berninger, & Busse, 1996). Thus, OWL LD may interfere with math learning. All students need to learn to process teacher instructional talk during math lessons including understanding math-specific vocabulary and strategies for reading and solving word problems. Effective instruction for dyscalculia includes oral language strategies for learning to count, remembering math facts, and applying the steps to adding, subtracting, multiplying, and dividing while keeping place value and part-whole relationships in mind.

These specific learning disabilities do not affect only the student, but also family members, who may feel pain when a child struggles in school. It is normal that parents seek answers to their questions about the nature of their child’s learning difficulties, but their need to understand is often misinterpreted as criticism of the educational program and leads to adversarial home-school relationships. It is also normal for parents to feel anxiety about how to help their child. Not only do parents want their child to succeed in life but also many parents relive the struggles they had when they were in school. At a time, when the federal mandate has been No Child Left Behind, we also need to remind the federal government that Childhood Should Not Be Left Behind. Children learn much from play with other children and extracurricular activities after school, which are as important as homework and test scores, especially for those with specific learning disabilities.

Because learning to read, write, do math, and use oral language is a journey for all students across 13 or more years, it is important to screen, link intervention to screening results, and monitor progress throughout K to 12 schooling. Early intervention has been shown to be effective in preventing or at least reducing the severity of many oral language, reading, writing, and math disabilities. However, because curriculum changes in the nature and complexity of what is required and expected to demonstrate learning, it is essential to monitor student progress and link assessment with instruction throughout the K to 12 school years. While these students may need accommodations linked to their specific disabilities, they also continue to benefit from FAPE K to 12. Many students may have strengths that mask their learning differences early in schooling but as the curriculum changes, specific learning disabilities may be observed for the first time. Often students report that the problems are invisible to others who don’t see how hard they have to work to achieve as much as other students. Likewise, many of the self-concept and emotional problems associated with chronic learning struggles can be prevented through early identification and intervention.

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Research has shown that students with specific learning disabilities fare better in life if their parents have provided social emotional support throughout their schooling. Parents should not feel that they have to provide the specialized instruction, which according to law, the school should provide. Parenting is challenging enough and as a society we do not do enough to recognize and celebrate those parents who parent extremely well. Many are recognizing that the next wave of research should be directed to educating parents on how to support a child with learning differences and guide them in developing positive, non-adversarial relationships with schools. At the same time research is needed on teaching educational professionals how to reach out to create more positive, non-adversarial school-home relationships. Students will be the winners if we can create win-win solutions for all.

At the national and state levels it would benefit all if regulations were less punitive and more supportive in helping both schools and families meet the needs of educating students with specific learning disabilities. Instead of penalizing schools for students not meeting standards on tests that do not take into account developmental or learning differences, federal and state funding might be provided for professional development to show the schools how they could improve learning outcomes for more students who have developmental and learning differences. At the same time, professional development should also be funded and provided for the policy makers, legislators, and government regulators on what research has shown about defining dysgraphia, dyslexia, OWL LD, and dyscalculia and effective teaching for students with one or more of these specific learning disabilities; such knowledge should inform the Common Core Standards and annual tests (See Berninger & Wolf, forthcoming).

Resources to Share with Educators

Arfé, B., Dockrell, J., & Berninger, V. (Eds.) (2015). Writing development in children with hearing loss, dyslexia, or oral language problems: Implications for assessment and instruction. NY: Oxford University Press. Also available as an ebook.

Berninger, V. (May/June 2012). Strengthening the mind's eye: The case for continued handwriting instruction in the 21st century. (pp. 28-31). Principal. National Association of Elementary School Principals. Invited. www.naesp.org

Berninger, V. (2013, March). Educating students in the computer age to be multilingual by hand. Invited Commentary on "The Handwriting Debate" NASBE Policy Debate (2012, September) for National Association of State Boards of Education (NASBE), Arlington, VA.

<http://www.nasbe.org/wp-content/uploads/Commentary-Handwriting-keyboarding-and-brain-development1.pdf>

Berninger, V. W., and Advisory Panel (2015). Interdisciplinary frameworks for schools: Best professional practices for serving the needs of all students. Washington, DC: American Psychological Association. Companion Websites with Readings and Resources. All royalties go to Division 16 to support these websites and develop future editions.

Berninger, V., & Niedo, J. (2014). Individualizing instruction for students with oral and written language difficulties. In J. Mascolo, D. Flanagan, and V. Alfonso (Eds.) Essentials of

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planning, selecting and tailoring intervention: Addressing the needs of unique learners (pp. 231-264). New York: Wiley.

Berninger, V., & Wolf, B. (2009a). Teaching students with dyslexia and dysgraphia: Lessons from teaching and science. Baltimore: Paul H. Brookes. Second edition expected 2015: Teaching Students with Dyslexia, Dysgraphia, OWL LD, and Dyscalculia: Lessons from Science and Teaching for All Teachers.

Berninger, V., & Wolf, B. (2009b). Helping students with dyslexia and dysgraphia make connections: Differentiated instruction lesson plans in reading and writing. Baltimore: Paul H. Brookes. Spiral book with teaching plans from University of Washington Research Program.

Henry, M. (2010). Unlocking literacy. Effective decoding and spelling instruction. Baltimore: Paul H. Brookes Publishing.

Nunes, T., & Bryant, P. (2009). Children's reading and spelling. Beyond the first steps. Oxford UK: Wiley-Blackwell.

Robinson, N., Abbott, R., Berninger, V., & Busse, J. (1996). Structure of precocious mathematical abilities: Gender similarities and differences. *Journal of Educational Psychology*, 88, 341-352.

Silliman, E., & Berninger, V. (2011). Cross-disciplinary dialogue about the nature of oral and written language problems in the context of developmental, academic, and phenotypic profiles. *Topics in Language Disorders*, 31, 6-23. free access at http://journals.lww.com/topicsinlanguagedisorders/Fulltext/2011/01000/Cross_Disciplinary_Dialogue_about_the_Nature_of.3.aspx

Wolf, B. (2011) Teaching Handwriting. In J. Birsh (Ed.), *Multisensory Teaching of Basic Language Skills: Theory and Practice*, Third Edition (pp. 179-206). Baltimore, MD. Brookes Publishing Co.

On-Line Resources

Berninger, V., & Fayol, M. (2008). Why spelling is important and how to teach it effectively. *Encyclopedia of Language and Literacy Development* (pp. 1-13). London, ON: Canadian Language and Literacy Research Network. National Centres for Excellence Canadian Language and Literacy Research Network (CLLRNet) Published online:

<http://www.literacyencyclopedia.ca/pdfs/topic.php?topId=234>

ON LINE JUST THE FACTS for INTERNATIONAL DYSLEXIA ASSOCIATION
Understanding Dysgraphia (Berninger & Wolf, 2012)

About the authors.

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