Imprecise Definitions of Dyslexia

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The loose and varied use of the label dyslexia to describe anyone who cannot read is confusing and unhelpful. Dyslexia is a neurologically related inability to decode text effectively, which may hamper or prevent comprehension in reading. Acquired dyslexia is due to brain injury, trauma, or stroke. Counter intuitively, developmental dyslexia is an inherent inability to develop rapid and accurate decoding skills in spite of effective instruction. Specific forms of dyslexia include phonological or deep dyslexia—an inability to rapidly associate letters to language sounds (grapheme-phoneme matching)—and surface dyslexia—an inability to identify word forms. Dyslexics can suffer from one or both of these conditions, and to varying degrees over time.

Strictly speaking, a diagnosis of dyslexia requires that the subject have no other specific or global disability that might otherwise account for the inability to read (e.g., visual impairment or general learning disability). This is because dyslexia is related to developmental disruption in brain areas that are specifically appropriated for subprocesses necessary in text decoding, such as rapid letter-sound matching or recognition of sight words. On the other hand, dyslexia often correlates with related conditions, such as language-sound processing deficits or rapid automatized naming deficits, and possibly has a complex causative relationship to them. But these are not specifically related to the decoding of texts and do not qualify as reading disability per se.

To make things more confusing, a behavioral deficit does not necessarily imply an inherent neurological dysfunction, and neither do brain scans indicating lack of activity in decoding-related areas. Lack of neural activity may be a symptom rather than the cause of dyslexia, as I will explain. Theories, and the research that enables them, are numerous and varied. In spite of claims by some experts promoting a particular theory, a definitive definition of dyslexia is not yet in hand.

For the time being, it is important to make a difference between true developmental dyslexia, as described above, and "pseudo dyslexia." True developmental dyslexics, as noted, demonstrate an inability to develop decoding skills in spite of effective reading instruction and in the absence of any other explanatory cause. By contrast, pseudo dyslexics are typically children who possess the ability to learn to decode texts but either did not receive effective instruction in school or had not yet reached an optimal developmental stage for making use of that instruction (longitudinal studies suggest that 25% or more of putatively dyslexic children identified in early elementary grades can self-remediate without intervention within two years). In other words, pseudo dyslexics are cases of misdiagnosis.

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Arguably, when dyslexia is defined loosely, upwards of 75% of students labeled dyslexic may be pseudo dyslexic. The good news is that such "dyslexics" can be easily cured with garden variety but intensively provided reading instruction. (The added intensity is stressed because such students have fallen behind and need to do more than just develop the ability to decode—they may also be expected to catch up to their grade level.) It is worth suggesting, however, that it would be more efficient and less costly for the schools if these students had enjoyed effective, developmentally appropriate instruction to begin with.

It should not be assumed that a child has had access to effective reading instruction from a credentialed and well-trained teacher simply because the child has attended school. To a greater degree than most realize, classrooms are at times headed by teachers lacking teacher training from an accredited institution who are hired provisionally to fill gaps in a school's staffing due to a lack of credentialed job applicants. This is especially true in high poverty

school districts in the inner cities and in under-populated rural areas. Such "temps," though sincerely concerned for their students' well being, typically have no formal understanding of how to teach, let alone how to teach something as complex as reading, let alone to a class of students at-risk for reading failure, as students in high poverty schools tend to be.

But even certified teachers can be stymied in providing effective reading instruction when the student is not yet developmentally ready for such instruction. Students are not simple blank slates. If the neuroscience research teaches us anything, it is that learning is literally a neurological growth process. Reading requires a preliminary level of cognitive development that allows for symbol identification, manipulation, and cross-association (among other things). As with just about any other biological attribute one might care to measure, rate of development demonstrates a normal distribution of variance in general populations.

Tracking age cohorts with the unwarranted expectation that all students should be at the same developmental level unreasonably misdiagnoses the bottom tail of performance as a deficiency, when, in many cases, it may only be early stage mastery. People vary in their rate of development. Some infants are born early, some late; some reach puberty, adult maturity, or middle age early, others late; some die early, some late; and these differences are not only by chance. Such trajectories run in families. Hereditable characteristics suggest a role for genetics in developmental difference, but deficiency requires an institutionally selected cut-score. Using cut-scores for ability relative to near-age peers as a required benchmark of deficiency may arguably lack validity in many cases.

Although the existence of what I here term pseudo dyslexics has been recently acknowledged by dyslexia researchers, earlier and more widely disseminated work had conflated true and pseudo dyslexics on the justification that both groups demonstrate similar lack of neural activation in brain scan studies. However, fMRI and other commonly employed brain scan methods cannot image the level of analysis required for what is, in the case of true dyslexics, an apparently genetic disorder. If genetics is the root cause of the disability, then dyslexia is a case of biochemical deficiency retarding or disrupting the development of neural circuitry in the brain areas typically recruited during efficient reading development. Disparities in activation of gross areas of brain anatomy, as indicated by fMRI, cannot distinguish such abnormal cell structures.

Moreover, given the molecular- and cellular-level source of the problem, the atypical activation of gross brain anatomy identified in brain scans is often only a symptomatic, not a causal, indicator of the disorder. Importantly, non-genetic causes, such as lack of effective or developmentally appropriate reading instruction, can also account for lack of development in essentially normal brain tissue, generating similar images indicating lack of activation. Carefully employing precise definitions should allow us to distinguish the difference. This is important because different causes require different forms of remediation.

Brain areas recruited for school skills such as reading are not hard-wired or developmentally inevitable. They necessarily require interaction with an appropriate environment to develop. Just because neural dysfunction can lead to lack of ability, it does not follow that lack of ability is always the result of neural dysfunction. (If your car is out of gas, it will not run; but if your car does not run, it is not necessarily out of gas.)

Precise definitions are also important for efficient administration of limited resources and the coherent formulation of effective governmental policy in regard to a disability. Unfortunately, the definition of dyslexia has undergone such egregious stretching over the past decade that remediation of our terminology may be in order. Enlarged definitions based on conflated categories lead to inflated

estimates of the percentage of children who suffer dyslexia, with some dyslexia specialists quoting rates as high as 20–30% of the school-age population. (Three to five percent may be more likely.) Because these sweeping definitions include so many pseudo dyslexics, remediation success rates are also inflated. Such ill-focused statistics may grab headlines and garner research and remediation funding, but they make a mockery of the intellectual integrity required of scientifically based clinical practice.

Urgent calls for early assessment of dyslexia, and recommendations for institutionalized early intervention, need to be evaluated cautiously. If precipitous action is instituted on the basis of carelessly broad definitions, scarce funding will be dependably misdirected on specialized remediation for either non-problems (extended developmental time-course), or what are essentially political problems (insufficient numbers of trained reading instructors). Additionally, the impact of inappropriate deficiency labels on students' self-efficacy and future school success is also a concern.

It is probably not reasonable to label distribution-typical differences in developmental time-course a developmental disability. It certainly is reprehensible to label at-risk students dyslexic when they have been denied effective instruction, misdiagnosing what is clearly a resource and policy dysfunction as a neurological deficiency of the child. And dragnet-styled definitions are particularly unfair to those who, in fact, have dyslexia. True dyslexics will not respond to intensive but standard reading instruction but they can often respond to research-based compensatory instructional approaches and decoding strategies that take advantage of the strengths and resources they do possess.

Dyslexia Resources

http://www.interdys.org/

The International Dyslexia Association (IDA) is a non-profit organization dedicated to helping individuals with dyslexia, their families, and the communities that support them.

http://www.ninds.nih.gov

The mission of NINDS is to reduce the burden of neurological disease—a burden borne by every age group, by every segment of society, by people all over the world.

http://www.ldaamerica.org

Learning Disabilities Association of America (LDA's) mission is to create opportunities for success for all individuals affected by learning disabilities and to reduce the incidence of learning disabilities in future generations.

http://www.coloradodyslexia.com

Dyslexia Institutes of America provides diagnostic and therapy centers for individuals 4.9 years old to adult living with Dyslexia.

http://www.dyslexia.com

Davis Dyslexia Association International

The Everything Parent's Guide to Children with Dyslexia; All You Need To Ensure Your Child's Success, by Abigail Marshall

Paperback, 320 pages. Publisher: Adams Media 2004. ISBN: 1593371357

The Gift of Dyslexia

Why Some of the Smartest People Can't Read and How They Can Learn, by Ronald D. Davis with Eldon M.Braun.(Perigee Books, Revised Edition, 1997)

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