



Thoughts on the Definition of Dyslexia

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Abstract

The International Dyslexia Association’s current definition of dyslexia was approved by its Board of Directors on November 12, 2002. After two decades of scientific inquiry into the nature of dyslexia, it is time to reconsider and potentially revise the definition in light of what has been learned. We propose a definition of dyslexia based on its essential nature. Dyslexia is a specific learning disability in reading at the word level. It involves difficulty with accurate and/or fluent word recognition and/or pseudoword reading. We also suggest that the definition should focus solely on dyslexia’s core features and should not include risk factors, potential secondary consequences, or other characteristics. Until those factors can reliably differentiate between those with and without dyslexia at an individual level, they should not be included in the definition.

Keywords Definition · Dyslexia

The definitive definition of dyslexia

Jessica is a 7-year-old second-grade girl who is struggling to learn to read. Her parents wonder whether she has dyslexia, having heard about dyslexia in the popular media. Her teacher also wonders. We need a definition of dyslexia that is both based on science and answers questions from struggling readers, their parents, school personnel, and community-based practitioners about whether an individual has dyslexia.

A scientific definition of a phenomenon must have several elements: It must be consistent with current knowledge of the phenomenon, allow for differentiation from other potentially related phenomena, be precise to avoid ambiguity, and have explanatory value. It is prudent that a definition of dyslexia be based upon what is currently known and distilled into a succinct and accurate portrayal of the very nature of dyslexia. Current and past definitions of dyslexia have been problematic (Frith, 1999), and some skeptics have questioned

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whether dyslexia is a unified concept that can be distinguished as a special subset from reading difficulties (Elliott & Gibbs, 2008). As noted in this special issue of *Annals of Dyslexia*, the problem of a definition continues to plague the literature. An appropriate definition must exist to continue the conversation regarding what dyslexia is, how to identify it, help individuals who have dyslexia become competent readers, and provide training to pre-service and in-service teachers so that appropriate reading instruction and interventions can be used to help struggling readers.

A well-articulated definition of dyslexia helps to negate any argument that debunkers have regarding the existence of dyslexia. An ambiguous definition lends itself to dyslexia deniers and those who resist utilizing the Science of Reading. The reading crisis has not abated. Presently, 40% of fourth-grade students in the USA are performing below the Basic level on the National Assessment of Educational Progress in reading (NCES, 2024). Performing below the Basic level indicates that the student is a struggling reader who is unlikely to comprehend what they are attempting to read. White et al. (2021) assessed fourth-grade students ($n = 1800$) who performed below the Basic level on the NAEP in reading and found that they performed very poorly on foundational skills and reading fluency. There is no question that far too many students are struggling to learn to read and are laboring when they do (see also Ontario Human Rights Commission, 2022).

The definition that is proposed in this paper is rooted in what is currently known about dyslexia and focuses exclusively on the practical aspects of helping people become competent readers. At its very essence, dyslexia describes a difficulty (dys) reading words (lexia). Since the earliest work examining why children struggle or fail to learn to read, the focus has been on the failure to read words. Word recognition skills are essential to reading comprehension. Inability to read words results in poor reading comprehension. From our point of view, the definition needs to focus on the nature of the disability and the ability to identify those with the disability. The salient aspects of the definition must lead to accurate identification. Therefore, only what has been demonstrated to clearly and unambiguously define dyslexia should be included in the definition. Only after any additional elements currently being scientifically evaluated can differentiate dyslexia from other difficulties clearly should those elements be included in the definition. Our suggested definition fulfills these criteria. To some, our proposed definition will be unsatisfying as it does not contain exclusionary factors such as “unexpected in relation to other cognitive abilities and the provision of effective classroom instruction,” nor does our proposed definition include secondary issues related to poor reading (e.g., poor spelling, difficulty with comprehension, poor growth of vocabulary and background knowledge), or risk factors such as family background (e.g., genetic contributions) or deficits in phonological processing. However, until a time in which exclusionary factors can be used to differentiate individuals with dyslexia from other proposed poor readers, a parsimonious definition that succinctly describes the difficulty is warranted. Risk factors and their early detection are incredibly important in prevention and early intervention, but risk does not define a phenomenon; it only suggests under what circumstances it might exist (Offord & Kraemer, 2000; Snowling & Hulme, 2024).

The definition of dyslexia is not just an academic pursuit but must also serve to identify the condition and potentially disrupt the course of its development. Reading failure is not only problematic at the academic level but often contributes to a host of negative social, emotional, and behavioral problems (Livingston et al., 2018). Children identified with reading difficulties are more susceptible to experiencing negative self-concept and self-worth (Zuppardo et al., 2021), comorbidities such as anxiety and depression (Margari et al., 2013), and suicidal ideation (Svetaz et al., 2001). Reading failure is also associated

with school dropout (Anderson, 2014; Hernandez, 2011), involvement in the juvenile criminal system (Cortiella & Horowitz, 2014), lower economic success (Rothwell, 2020), and poor physical health outcomes (DeWalt et al., 2004; Shulman & Trabucchi, 2023). These consequences are very real, yet at the same time do not define the disorder.

The current definition (Lyon et al., 2003) was approved by the International Dyslexia Association's Board of Directors on November 12, 2002:

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

The definition that we propose is designed to efficiently answer the question of whether an individual has dyslexia. There is strong consensus among current definitions (i.e., Lyon et al., 2003; Rose, 2009) that dyslexia is first and foremost a problem with reading at the word level. There may be other difficulties that accompany decoding and word recognition challenges, but the key feature of dyslexia concerns difficulties reading words. With this and other issues in mind, the simplest way to define dyslexia would be:

Dyslexia is a specific learning disability in reading at the word level. It involves difficulty with accurate and/or fluent word recognition and/or decoding pseudowords.

Therefore, the essential features to address whether an individual has dyslexia involve measuring word recognition (accuracy and speed of word reading) and decoding (accuracy and speed of decoding pseudowords). Poor performance in any of these four areas (accuracy and speed of word and/or nonword reading) should lead to an identification of dyslexia. Our proposed definition distills what the vast literature regarding dyslexia unanimously agrees upon, that dyslexia is a difficulty reading words.

The next two sections address the most problematic components of the current IDA definition, (1) that dyslexia “is often unexpected in relation to other cognitive abilities,” and (2) that dyslexia occurs even with “the provision of effective classroom instruction.” The last sections address what we consider less problematic but unnecessary components of a revised definition.

Discrepancy definition of dyslexia (AKA the zombie definition of dyslexia)

The most problematic aspect of the current definition is the inclusion of criteria that suggest that a discrepancy exists between cognitive abilities and reading (“...that is often unexpected in relation to other cognitive abilities”). Empirical evidence demonstrates that the discrepancy definition of dyslexia is inaccurate, prejudicial, and simply not useful. Despite all the evidence against it, the discrepancy definition, like a zombie, refuses to die. The related practice of using IQ cut scores to determine who is “intelligent enough” to receive a dyslexia diagnosis has also been prevalent (Cotton et al., 2005; Hammill & Allen, 2020) and still exists as an option for identifying children with dyslexia in the Individuals with Disabilities Education Improvement Act [IDEA, 2004; §614(b)(6)]. Many studies have found no evidence to indicate that poor readers of different IQ levels differ in

the cognitive processes involved in reading or in their patterns of errors (Siegel, 1988b; Stanovich & Siegel, 1994). The “discrepancy definition” (i.e., that the student’s IQ score must be significantly greater than their reading score or some variation of this model) to identify dyslexia has been discredited. Research shows no significant differences in the processes involved with reading between those who have a discrepancy between their IQ scores and their achievement scores, and those who do not (e.g., Fletcher et al., 1992; Siegel, 1992), nor are there any differences on measures using brain imaging (Tanaka et al., 2011). Furthermore, analysis of patterns of subtest performance on an IQ test does not reliably differentiate between children with dyslexia and typically achieving children and does not indicate any relationship with achievement scores (see e.g., D’Angiulli & Siegel, 2003).

Most importantly, evidence-based remediation is equally effective at all IQ levels (e.g., Hurford et al., 1994b; Pogorzelski & Wheldall, 2002; Stage et al., 2003; Stuebing et al., 2009). For example, when typical readers, poor readers who met the discrepancy definition, and intellectually commensurate readers (poor readers who did not meet the discrepancy definition) were compared, the groups of poor readers did not perform statistically differently from each other but were significantly poorer than the typical or good readers (e.g., Hurford et al., 1994a, b; Siegel, 1992; Stanovich, 1991; Vellutino et al., 2000). Siegel (1988b) differentiated 250 reading disabled and 719 nondisabled students into IQ-level groups based on their performance on the WISC-R. Measures examining reading, spelling, and syntax were predicted better by reading status than by IQ. The core deficits of dyslexia, word-reading difficulties, are independent of IQ. Differentiating poor readers based on intellectual functioning through use of discrepancy or an average intelligence criterion provides no benefit to understanding their reading challenges and serves as an arbitrary way to exclude individuals.

Another important reason for objecting to the IQ test or a test of “reasoning” or “thinking” as an essential component of the definition or evaluation of dyslexia is a social justice issue. Families from lower SES backgrounds are more likely to be prohibited from accessing costly evaluation services and receiving the services their children need. For example, Maki and Adams (2019) found that 30.4% of school psychologists were using the discrepancy model to identify children with specific learning disabilities, and nearly all of them received training to do so while in graduate school (96.5%). Not only is the discrepancy model an unjustified mechanism for the evaluation and diagnosis of dyslexia, but families who disagree with school-based evaluations often use their own resources for a non-school-based evaluation, even though such an evaluation is guaranteed to be paid at the public’s expense (34 CFR §300.502; IDEA, 2004). Moreover, a school system has the right to due process to argue that their evaluation was sufficient and appropriate; thus, parents must engage in the legal system at their expense. If parents are not successful at the due process hearing or lawsuit, they are responsible for the costs. With the dismantling of the Department of Education and, in particular, the Office of Civil Rights, these concerns are much greater today than they were prior to the current administration. Families with the financial means to pay for an external evaluation can have that information considered at their child’s individualized education program (IEP) eligibility meeting. In contrast, families who cannot afford an evaluation or are unable to secure school district funding for an independent educational evaluation (IEE) are less likely to have eligibility disputes resolved in their favor, (Hurford, 2023; Zirkle, 2012; see also Zirkle, 2017) leaving their children less likely to qualify for the services they desperately need.

Socio-economic status is also linked to performance on intelligence tests (Falk et al., 2021), such that children of lower SES families are less likely to have a significant gap between their IQ and reading scores or to meet an “average range” criterion, which reduces

the opportunity of being diagnosed with dyslexia in this population (Macdonald & Deacon, 2019; Siegel & Himel, 1998). Intelligence tests have also been demonstrated to be culturally loaded and are more likely to lead to misclassification (Lozano-Ruiz, et al., 2021; Sternberg, 2004). Routine use of IQ tests is arbitrary, costly to students, families, professionals, and schools, and primarily benefits test publishers.

Emphasizing reading achievement rather than intelligence also affords practical advantages. Teachers and other school personnel can be trained to administer assessments that directly inform effective instruction and targeted interventions. When properly conducted, including analysis of relevant errors, standardized achievement tests can offer valuable insights into appropriate individual or small-group interventions for individuals with learning disabilities. These educators can also collaborate with schools, post-secondary institutions, or adult literacy programs to provide guidance on evidence-based interventions.

The harm to children and families from discrepancy and intelligence testing criteria recently made headlines in *Scientific American* (Carr, 2023). In her article, *Too Many Schools Are Misdiagnosing Dyslexia*, Sara Carr quoted Tim Odegard, who stated that he "...regularly hears from families frustrated that their kids were disqualified from reading services ... (because) testing determined that they are not 'smart' enough to be dyslexic." The notion that these children are not "smart enough" is likely linked to verbal skills that are readily influenced by environmental variation in language exposure and opportunity. Maintaining an "unexpected" component, as in the current definition, is "...unfair, it's discriminatory, and it disadvantages already economically disadvantaged kids" (Fletcher, quoted in Carr, 2023).

The current definition excludes some students at the tail end of the continuum of word reading accuracy and fluency based on some absent characteristic(s) (e.g., intelligence criteria or discrepancy with achievement, processing impairment, heritability, or cause of disability; Miciak & Fletcher, 2020) and is problematic. Research has shown these arbitrarily created groups are *not* meaningfully different in relation to the core academic skills and their response to effective instruction and interventions (for a discussion and empirical evidence, see Elliott, 2020; Hurford et al., 1994a, b; Miciak & Fletcher, 2020, 2023; Siegel, 1989, 1992; Siegel & Hurford, 2019). Additions of statements recognizing that *all* poor readers need access to interventions does not justify arbitrarily differentiating the groups into dyslexic vs non-dyslexic readers. Instead, such distinctions often serve to maintain dyslexia as a diagnosis primarily accessible to students from more privileged backgrounds, who have greater access to experiences, resources (e.g., Odegard et al., 2020), and costly, overly complex evaluations with long waiting lists that delay intervention services.

Adequate instruction

The second problematic component of the current definition is that dyslexia is purported to occur even with "... the provision of effective classroom instruction." That is, an individual must have received adequate instruction before they can be identified as dyslexic. One issue with this notion is that the term "effective" means that the intended outcome was achieved. That reading failure exists at all implies that "effective" classroom reading instruction has not occurred. A second issue is that far too many children have not received effective classroom instruction. This has most certainly been the case: Approximately 40% of fourth-grade students are not reading at proficient levels, yet the prevalence of dyslexia is estimated to be much lower. Moreover, with optimal classroom instruction, not all

individuals at risk for dyslexia will experience reading failure. For the past half century, the prevailing method to teach early reading has been centered around the three-cueing system (e.g., Balanced Literacy, Whole Language, etc.). Kurtz et al. (2020) found that, of a group of K-2 teachers, 68% indicated their philosophy of teaching early reading was based on Balanced Literacy, 72% indicated that Balanced Literacy was the instructional approach used at their schools, and 75% indicated that they used three-cueing. These methods of teaching are not aligned with what science has determined to be appropriate instructional methods for teaching reading. That being the case, under a stringent application of the current definition, a great many children who are experiencing reading failure, including those who may have dyslexia, cannot be diagnosed as having dyslexia. They have not been taught using appropriate instructional methods.

The inclusion of “effective classroom instruction” in the definition of dyslexia shifts responsibility for reading failure from the instructional approach to the child. Yet research suggests that nearly 96.5% of students could become competent readers if curricula aligned with Structured Literacy were used both as the core instructional approach and to support struggling readers (Al Otaiba & Fuchs, 2006; Mathes et al., 2005; Torgesen, 2009). Children at risk for dyslexia can be prevented from experiencing reading failure when the mechanics of reading are systematically and explicitly taught (e.g., Hurford et al., 2013; Torgesen, 2004). These studies provide evidence that reading curricula based on science can prevent reading failure, including for students who would otherwise be identified as having dyslexia. If nearly 40% of children are performing below the Basic level, by definition, the curricula being used to teach reading are clearly not effective. Were the curricula effective, nearly all children would learn to read. The circular use of the phrase “effective classroom instruction” muddles the definition and enables school systems using non-scientific curricula to blame students rather than inappropriate instruction. As currently applied, the phrase “effective classroom instruction” warrants removal from the definition.

The provision of truly effective classroom instruction leads to proficient reading skills and is not an appropriate consideration for differential diagnosis. Our proposed definition does not include components of “unexpected in relation to other cognitive abilities” and “the provision of effective classroom instruction,” as we have argued that neither is a necessary nor accurate criterion to identify dyslexia. If a student is experiencing reading failure at the word level, they would be considered to have dyslexia under the definition proposed in this paper. It would not matter what type of curriculum is being used or how well-trained or successful the educator is in teaching from that curriculum; if they are struggling readers, they need to be identified as such. When students are exposed to Structured Literacy-based practices, they perform significantly better than students who are not (Brady, 2011; Hansford et al., 2025; Spear-Swerling, 2019), and reading failure can be ameliorated for students with dyslexia.

Neurobiological basis

Although it is tempting to include in the definition a statement indicating that the basis of dyslexia is neurobiological, we feel it is essential to adhere to the requirement that the definition provide a strong mechanism to differentiate between good and poor readers. Although there is evidence that neurological conditions underlie potential differences between dyslexics and non-dyslexics (typical readers), those conditions currently do not allow for a differential diagnosis for individuals. The interplay between neurological and environmental contributions is not only complicated but not currently disambiguated

(Duranović et al., 2024; Peterson & Pennington, 2015; Theodoridou et al., 2021). In addition, all behavior, including that related to other disabilities, is neurobiologically based. Our proposed definition does not negate the important work of behavioral neuroscientists who examine brain-based issues that contribute to furthering our understanding of dyslexia, but this does not inform differential diagnosis. That is, it is not currently possible to assess a person via functional magnetic resonance imaging (fMRI) or other tomographies to determine if that person has dyslexia. The literature strongly suggests that the brain architectures and use of those architectures are different in people with dyslexia from people without dyslexia—typically defined as age- or reading-level matched controls with average reading skills (e.g., Hancock et al., 2017; Hoeft et al., 2007; Paulesu et al., 2014)—and that these differences exist regardless of the type of writing system (e.g., Li & Bi, 2022). There are two primary difficulties when thinking about defining and identifying dyslexia. First, the various tomographies do not lend themselves to individual identification. For example, Zahia et al. (2020) used convolutional neural networks and fMRI to determine if a child had dyslexia. Their classification scheme resulted in 72.7% accuracy with a sensitivity of 75%, specificity of 71.4%, and precision of 60%. All these values are relatively low for practical use (Plante & Vance, 1994). A great many children would be misidentified. Second, this research shows brain-based differences between groups defined on behavioral measures of reading—it does not support the inference sometimes made that dyslexic readers differ from some hypothesized group of poor word readers without brain-based differences.

Many researchers agree that dyslexia is a condition identified by performance at the lower end of the normal distribution of word reading skills (e.g., Al-Shidhani & Arora, 2012; Shaywitz et al., 1992; Snowling et al., 2007) rather than a discrete category characterized by qualitative differences from non-dyslexic readers. Including the term neurobiology implies that there is a group of poor readers who have reading disabilities due to neurological etiology and that this group can be differentiated from poor readers whose etiology is environmental, such as those whose instruction does not teach how alphabetically based systems must be decoded or those with parents who do not read to them. There may come a time when such a differentiation is possible and has advantages for understanding or intervening; on the other hand, we may find that brain-based characteristics are more similar than different in poor word readers, regardless of some hypothesized differential pathways into poor reading. Simply stating that dyslexia is a disability in which a person is challenged or not able to accurately and fluently read words and nonwords is sufficient to highlight the nature of dyslexia.

Spelling

We believe the definition of dyslexia should include only the essential features that characterize the disability and support its identification, and for that reason, should not include spelling. Although spelling deficits are often present when one experiences word reading deficits (Treiman et al., 2024), they have also been shown to be dissociable (e.g., Descheemaeker et al., 2005; Hepner et al., 2017; Siegel, 1988a). There are competent readers who struggle with spelling (Holmes & Quinn, 2009; Lennox & Siegel, 1993; Moll & Landerl, 2009; Treiman, 2017), especially with the English writing system, which is relatively opaque (Perfetti & Dunlap, 2008). There are also competent spellers who struggle with reading. Wimmer and Mayringer (2002) assessed over 600 third- and fourth-grade students learning to read in Greek, a highly transparent language. Twenty-two percent had

at least one deficit. Of these, 32% had only a reading fluency deficit, 24% only a spelling deficit, and 45% had both. Of the 325 students with a reading fluency deficit in Moll and Landerl's (2009) replication study involving 2,029 German students, 40% demonstrated average spelling performance. Similar dissociations were found in a large-scale longitudinal study with Finnish students in first to fourth grade; 1.8% had persistent reading fluency deficits, 2.1% had persistent spelling deficits, and 3.0% had persistent difficulties in both (Torppa et al., 2017). In Fayol et al.'s (2009) study of 1,453 French students, 4.0% met their criteria as having poor reading fluency (i.e., below the 30th percentile) and good spelling skills (above the 70th percentile), with this group of good spellers representing 18.8% of the population with reading difficulties. Correlations between word reading and spelling range from about 0.75 to 0.87 and tend to decrease for older participants (Kim et al., 2024; Treiman et al., 2024) and in languages other than English (e.g., Chinese, Kim et al., 2024; German, Moll & Landerl, 2009).

Spelling and reading are dissociable skills, and spelling deficits are neither necessary nor sufficient to identify dyslexia. An unintended consequence of requiring that spelling be part of a definition of dyslexia would be that its inclusion could result in a barrier to identification and intervention for some students with word reading difficulties but adequate spelling. In summary, we agree with Elliott and Grigenko's (2024) argument for not including spelling as a component of the definition of dyslexia: "Thus, in order to avoid confusion as to the specific nature of an individual child's literacy difficulties, and to provide the most focused and targeted forms of intervention, reading and spelling deficits should be assessed and identified independently, with the term dyslexia reserved solely to describe problems with accurate and fluent reading" (p. 364).

Reading comprehension

Dyslexia is a difficulty with processing print at the word level (Meisinger et al., 2022; Metsala & David, 2022). Although this can and does negatively impact reading comprehension, the deficits in reading comprehension and measures of such are not integral to defining or identifying dyslexia. Reading comprehension performance depends on background knowledge, vocabulary, and language skills in addition to decoding skills (Lesaux et al., 2006a; Metsala et al., 2021; Smith et al., 2021). A measure of reading comprehension may tell little about word reading, which is essential to defining dyslexia. In addition, the issue of timing is critical. Whether or not the test is timed can influence the performance on a reading comprehension test (Lesaux et al., 2006b). In these ways, reading comprehension tests do not help to illuminate word-level reading skills.

Processing difficulties

The current definition mentions the "phonological aspect of language." Phonological processing deficits are neither necessary nor sufficient to identify dyslexia (Elliott, 2020) and may be present in typical readers (Catts et al., 2017). An overemphasis on cognitive and/or language processes in relation to learning disabilities has led the field to numerous assessment approaches, largely invalid, unreliable, and unnecessary (e.g., Dombrowski & McGill, 2024; Fletcher & Miciak, 2017; McGill et al., 2016). The search for cognitive processing profiles keeps the assessment industry funded, rather than placing the needed focus on evidence-based instruction and intervention.

Familial risk

Some argue that including an assessment of family risk is one factor that could contribute to reliably and validly diagnosing dyslexia. A focus on family history is problematic and irrelevant. The definition should be based on the essential components of dyslexia and identification on an individual's reading ability (accuracy and fluency of decoding and word recognition). Risk factors, in general, are not a defining characteristic of a given disorder. Most importantly, if the individual in question does not have a family history of reading difficulties, does that mean they do not have dyslexia? Of course not. Family risk is unreliable at the individual level and will invariably give priority to some individuals above others. Although there are genetic underpinnings for dyslexia, the realization of those genetic potentialities is complicated and may require environmental triggers in addition to a genetic constitution. Many families are not familiar with dyslexia or have not been assessed for it. As a result, they would not be able to contribute to family risk status. Are we to consider the diagnosis of these individuals as less reliable or valid? Including information in a definition should inform diagnosis and/or intervention (Dombrowski et al., 2022). We argue that family history, at the present time, does not meet either criterion.

The continuum issue

We endorse the use of cut-off scores on the reading measures to define dyslexia. That is, if an individual scores below a specified cut-off value on word or pseudoword reading accuracy or fluency, they would be identified as dyslexic. This definition is consistent with a low-achievement model of learning disabilities, which has been shown to have strong validity (Fletcher et al., 2005; Siegel, 1992), and multiple measures of these constructs will enhance reliability. If an individual scores close to the cut-off score on multiple tests or testing occasions, but not within the range defined as dyslexic, then the individual would not be considered dyslexic. As dyslexia exists along the continuum, the use of a cut-off score is, admittedly, arbitrary. However, we think that this is the most practical way to define dyslexia. We propose the following cut points for dyslexia: Scores at or below the 16th percentile represent individuals with dyslexia, with scores below the 8th percentile identified as severe, and those from the 9th to the 16th percentile as moderate. These are arbitrary classifications, but as scores above the 16th percentile represent those within one standard deviation of the mean—the average band of performance—it may be impractical to define dyslexia above the 16th percentile in word recognition (e.g., Moll & Landerl, 2009). But scores in the 17th to 25th percentile range are an indication of a weakness and perhaps could be referred to as word reading difficulties, following our colleagues in the math domain (for review, see Nelson et al., 2022). Presently, there are a multitude of estimates of the prevalence of dyslexia (e.g., IDA, Yang et al., 2022), and the way that dyslexia is operationally defined affects those estimates (e.g., Wagner et al., 2020).

The definition

We have been arguing for decades that the appropriate evaluation for dyslexia involves word level reading (i.e., word reading accuracy and fluency for reading real and

pseudowords). Our proposed definition is a low-achievement model, which has established validity (e.g., Fletcher et al., 2005). If there are deficiencies in these word-level reading skills, then interventions to improve these skills based on science are successful for many in remediating reading difficulties. Evidence also suggests that preventive curricula based on the mechanics of reading help to strengthen reading, spelling, writing, and comprehension skills. Presently, there is enough scientific evidence that appropriate curricula can prevent reading failure in most children. Early identification of risk status is possible based on performance on phonemic awareness, letter knowledge, and beginning word decoding skills, and remediation strategies are beneficial for struggling readers. It is best to deploy this knowledge to those who (1) work with young children so that they can identify risk status early, (2) teach children to read so that they know the appropriate science-based curricula, and (3) work with struggling readers so they can use intervention techniques that will result in competent reading skills. Definitions of dyslexia must address the science-based skills that will lead to competent word reading accuracy and fluency.

Consider the following. A woman finds a lump in her breast. She wants to know whether it is malignant. Her physician orders tests including ultrasound biopsy. The physician does not make a determination based on whether she has a family history or any of the risk factors, such as smoking, that may be correlated with breast cancer. This woman wants the results of the biopsy and, if warranted, intervention as soon as possible. This is the most efficient model that we propose for examining whether someone has dyslexia and for defining dyslexia. There are no medical tests that will answer this question, only behavioral reading tests such as we have described. Let us begin to clearly and unambiguously define dyslexia so that valid identification and effective intervention can occur as soon as possible, and more individuals can become competent readers.

Author contribution All authors contributed to the study conception, design, and write-up.

Declarations

Competing interests The authors declare no competing interests.

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