

Comment

On the many terms for developmental language and learning impairments

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Abstract

The terms Language Disorder, Developmental Language Disorder (DLD), Language-based learning disabilities, Specific Learning Disorder, and Specific Learning Disability are commonly used to describe children struggling to learn at school. In this position paper, the definitions and distinctions between these terms are discussed, and key overlaps and differences described. Although often used interchangeably, Specific Learning Disorder and Specific Learning Disability are not synonymous. Based on current definitions, both children with DLD and children with Specific Learning Disorder could be classified as having a Specific Learning Disability in the educational setting. In educational settings, children with DLD may additionally be identified using terms such as Language Impairment, Speech, Language, Communication Needs (SLCN), and others. Despite the problematic overlap in the names Specific Learning Disorder and Specific Learning Disability, one advantage of the latter term is the acknowledgement that many skills underlying academic learning are language-based thereby capturing the disability experienced by children with language or academic learning disorders.

Keywords Developmental language disorder · Specific learning disability · Learning disability · Specific learning disorder

Language Disorder, Developmental Language Disorder, Language-based learning disabilities, Specific Learning Disorder, Specific Learning Disability—are you confused by this list of terms? You're not alone, and you're not to blame. All of these terms are used to describe the communication and learning difficulties children experience at school. Children with these conditions will usually need extra support in school. Rarely, however, have these disorders been studied in relation to one another, and so their respective impacts on communication and learning, and their responses to different interventions are not well understood. A place to begin this work is by highlighting the overlap and differences in the definitions and uses of these terms, which is the purpose of this position paper. One goal of this paper is to promote accurate identification of these conditions and their manifestations. A second aim is to facilitate shared terminology and interprofessional collaboration between those who work to identify and support children with these conditions including speech-language pathologists, educational psychologists, and teachers.

Let's begin by examining the diagnostic categories related to developmental language and learning disorders. There are two major mental health classification systems, the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; [2])

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and the *International Classification of Diseases and Related Health Problems* (ICD-11; [65]), with considerable alignment between them [51]. The purpose of these systems is to provide medical diagnoses, and both include the broad heading of Neurodevelopmental Disorders. Neurodevelopmental Disorders are a group of conditions characterized by deficits producing impairments of personal, social, academic or occupational functioning with onset in the developmental period, that is, existing from birth not acquired through illness or injury. The two neurodevelopmental disorders of particular interest in this paper are *Language Disorder* (DSM-5; or *Developmental Language Disorder*, ICD-11) listed within the diagnostic category of *Communication Disorders* (DSM-5; or *Speech and Language Disorders* in ICD-11), and *Specific Learning Disorder* (DSM-5; or *Developmental Learning Disorder*, ICD-11), a separate diagnostic category with specifiers (DSM-5) or sub-classifications (ICD-11) related to reading, written expression, and mathematics. Key commonalities between these disorders are with regards to their dimensionality, and what we understand about their aetiologies. Although the precise causes of Language Disorder and Specific Learning Disorder are unknown, there is an assumption—in both cases—of the primacy of biological factors (i.e., the combined effect of many genes) interacting with nonbiological factors to produce relevant manifestations, hence their inclusion within the DSM-5 and ICD-11 and use of the term ‘disorder’ [64]. In these cases, ‘disorder’ is not an exact term, but is used to describe a clinically recognizable set of symptoms or behaviour. When these clusters of symptoms form a clear category distinct from those without the condition, identification is easier. Developmental language disorders and learning disorders, however, are dimensional, that is, there is a continuum from those without the disorder to those at the low end of the continuum, some of whom have the disorder with varying degrees of severity. There is no natural threshold that separates individuals with and without the disorder. Another key overlap between language and learning disorders highlighted throughout this paper is their impact on daily activities including learning. It is important, then, to understand these disorders in detail as accurate identification is instrumental to the provision of appropriate educational and vocational accommodations for success.

1 Developmental language disorder

According to the DSM-5, Language Disorder is a term used to describe persistent difficulties in the acquisition and use of language across modalities (i.e., spoken, written, sign language, or other) due to deficits in comprehension or production of vocabulary, sentences, or discourse. Additional diagnostic criteria from the DSM-5 include language abilities that are substantially and quantifiably below expectations resulting in functional limitations in communication, social participation, academic achievement or occupational performance. Onset during the early developmental period and difficulties not being attributable to other causes (i.e., sensory or motor impairment; medical or neurological condition; intellectual disability) are also required. Although the need to assess both expressive (production) and receptive (comprehension) language skills is described, no further subtypes or specifiers to the DSM-5 Language Disorder category are included. Specifically, the subtypes of receptive language disorder, expressive language disorder, and mixed receptive-expressive language disorder introduced into the DSM in 1987 were not retained in the DSM-5 [35]. In the ICD-11, the corresponding category, *Developmental Language Disorder*, is consistent with the DSM-5’s Language Disorder but does include subtypes with specific deficits in receptive/expressive, mainly expressive, mainly pragmatic, or other patterns. With the advent of the ICD-11, neither classification system includes discrepancy with intellectual functioning as a criterion, other than to rule out intellectual disability (the ICD-10 referred to language skills being ‘below appropriate level for mental age’). The DSM-5, but not the ICD-11, includes a separate category, *Social (Pragmatic) Communication Disorder*, describing persistent difficulties in the social use of verbal and nonverbal communication in the context of adequate developmental progress in speech and other areas of language. Historically, children with language disorders have been labelled with a variety of largely synonymous terms including specific language impairment, developmental aphasia, and others [4].

More recently, a group of experts published a consensus on terminology for childhood language disorders referred to as ‘The CATALISE studies’ [5, 6]. The consensus was to use the overarching term, *Language Disorder*, to recognize language disorders whether or not they occurred as part of a complex pattern of impairments associated with a differentiating biomedical condition and regardless of whether there is a mismatch with nonverbal ability. By documenting a language disorder when observed, a greater awareness and understanding of the impact of the language disorder on a child’s learning can be achieved. However, the term Language Disorder was considered too broad to be of use in describing and raising awareness of childhood language disorders. Two subtypes were suggested, in particular, for those with a differentiating biomedical condition (typically including language disorder as part of its profile), *Language Disorder associated with {biomedical condition}*, and for those with no differentiating condition, *Developmental Language Disorder* (DLD). No separate category specific to pragmatics was suggested because pragmatics was considered a part of

language, and hence pragmatic impairment as a type of language disorder. The CATALISE's use of Language Disorder as an overarching term, then, describes a broader group than that referred to by this term in the DSM-5 because the CATALISE term includes language disorders regardless of associated conditions. DLD, on the other hand, is consistent with the DSM-5's Language Disorder, and encompasses the DSM-5's Social (Pragmatic) Communication Disorder [50]. DLD is also consistent with the ICD-11's use of the term. Practitioners who provide either of the DSM-5's Language Disorder or Social (Pragmatic) Communication Disorder labels will want to make sure that the child's service team and family are also aware of the term DLD. With recent efforts to increase awareness of DLD, high quality and accessible information about DLD is now available (see RADLD.org and DLDandMe.org). Given the greater precision of the term, Developmental Language Disorder (DLD) will be used for the remainder of this paper.

DLD is a heterogeneous category best viewed as a spectrum disorder with nonrandom but highly overlapping trait clusters [38]. Affected areas of language can include phonology, syntax, word finding and semantics, pragmatics / language use, discourse, and verbal learning memory. Notably, individuals with DLD differ in which areas are affected and to what extent. As indicated by the DSM-5 and ICD-11's recognition of language disorder crossing modalities (spoken, written, signed), reading and writing are commonly affected in DLD [6]. DLD is a persistent problem, but changes in how it is manifested over the lifespan. For the most part, DLD is a hidden disorder. Frank spoken language errors (e.g., grammatical errors) are likely to be observed in everyday talk only amongst young children with DLD or when a discourse task imposes high cognitive demands [37], if at all. There might be no signs of DLD in the everyday conversational language of older children and adults with DLD. Older individuals with DLD, however, might struggle with understanding, retelling, or discussing more complex topics or stories, using more complex sentences, or finding the words they want to say [45]. Similar, but more marked difficulties will be observed with the added complexity of written material. Many individuals with DLD will struggle to understand complex written material or write grammatically correct sentences, and may avoid such tasks in adulthood [8]. These difficulties will impact learning across the educational curriculum given that language is the medium of instruction and specialized vocabulary and expressions are used. For example, word problems in math might be particularly challenging for individuals with DLD to understand [10]. In some cases, DLD is not apparent until the child's language skills are challenged through school learning [19]. Difficulties with language can also make it difficult for individuals with DLD to make friends, maintain emotional health, or find a job [16].

2 Specific learning disorder

Both the DSM-5 and ICD-11 describe Specific/Developmental Learning Disorder as a persistent difficulty learning and using academic (scholastic) skills. Although the ICD-11 lists separate disorders for reading, written expression, mathematics, and other patterns, the DSM-5 lists specifiers for impairment in reading (word reading accuracy, reading rate or fluency, reading comprehension), impairment in written expression (spelling accuracy, grammar and punctuation accuracy in written expression, clarity or organization of written expression), and impairment in mathematics (number sense, memorization of arithmetic facts, accurate or fluent calculation, and accurate math reasoning), along with specifiers for current severity (mild, moderate, severe). Each impaired domain and subskill should be described when identifying a Specific Learning Disorder, although the diagnosis may still be given even if manifestations are limited to only one domain or subskill. Additional diagnostic criteria from the DSM-5 include academic skills that are substantially and quantifiably below expectations causing significant interference with academic or occupational performance, or with activities of daily living. Also required is onset of the difficulties during school-age years, and the difficulties not being better accounted for by other conditions, psychosocial adversity, lack of proficiency in the language of instruction, or inadequate instruction. It is acknowledged that the difficulties may not be apparent until the academic demands exceed the individual's capacity in affected domains. Difficulties in the core academic domains are expected to impede learning in other academic subjects. In the long term, individuals with specific learning disorder are at risk for unemployment, underemployment, and poor mental health [23, 44]. Of relevance to the current paper, the DSM-5 states that a history of delayed language development is a common feature of specific learning disorder.

For the first time since 1980 (i.e., DSM-3), the DSM-5 integrated Specific Learning Disorders under one label instead of retaining the separate disorders: reading disorder, writing disorder, and mathematics disorder. There is considerable variability both within and between these classifications, a lack of isolated neural deficits [49], high rates of comorbidity [26]. Given these and the dimensional framework of the DSM-5, the decision was to have one single category for Specific Learning Disorder, but to use specifiers to capture the developmental course and severity of various manifestations at the time of assessment [56]. Specifiers are not mutually exclusive, which means manifestations across academic domains can

be captured within a single diagnosis. One of the most common manifestations of Specific Learning Disorder is *dyslexia*, a difficulty mapping letters with the sounds of one's language in order to read printed words typically resulting from a deficit in the phonological component of language [20]. In the DSM-5, dyslexia is suggested as an alternative term for problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities. Notably, individuals with dyslexia commonly have difficulties in reading comprehension, writing, and math, which may additionally require specification in the diagnosis if substantially and quantifiably below expectations. *Dyscalculia* is offered as an alternative term to refer to problems processing numerical information, learning arithmetic facts, and performing accurate or fluent calculations. There is a high degree of co-occurrence in dyslexia and dyscalculia likely due to shared cognitive processes that support the accurate and fluent retrieval of word and basic number facts including phonological processing and rapid naming of letters or numbers [15, 36]. Nevertheless, some individuals with dyscalculia have more math-specific deficits related to numerosity [63], mathematical procedures [21] and mathematical computations [20]. Although dysgraphia is a commonly used term to refer to disorders of writing related to legible and automatic letter writing, this term is not included in the DSM-5 as an alternative term.

3 Differential diagnosis and/or comorbidity of DLD and specific learning disorder

In theory, it seems that it should be possible to distinguish DLD from Specific Learning Disorder based on several factors (see Table 1).

First, consider how and when the relevant information is learned. For language, humans have a psychological and neurobiological preparedness for early and universal acquisition, use, comprehension, and production [52]. Language growth is rapid and variable during the early years, but individual differences in language development are relatively stable by 4 years of age [11] making it possible to identify language disorders persisting into adulthood around this time [40]. Explicit instruction (direct teaching) and noticing can boost implicit processes, but play a comparatively minor role in first language acquisition [18]. When learning a second language sequentially, explicit instruction is needed to focus attention on important contrasts otherwise lost amongst competing cues [18]. Notably, when children are exposed to multiple languages from birth, they acquire both languages implicitly through naturalistic exposure. Additionally, exposure to multiple language does not cause a language disorder. In contrast, academic learning, the learning of skills forming the core of the general school curriculum in schools including the abilities to read, write, and do mathematical calculations and problems is not simply a matter of biological maturation. Children learn to read, write, spell, and perform mathematical computations when they are introduced to these activities at home and school [64]. Academic learning requires explicit instruction, a conscious investment of time and effort, and lots of practice [52], and so learning disorders can only be identified after a minimum of 6 months of adequate instruction in formal schooling. In short, talking is considered a developmental milestone that emerges with brain maturation whereas academic skills must be taught and learned explicitly.

Another difference between DLD and Specific Learning Disorder surrounds oral and written language. DLD is a disorder of language, the complex system of words and symbols used to communicate meaning. The symbols can be spoken, written, or signed, and are governed by rules across overlapping domains for combining movements into sounds (phonology), sounds into words or part words (morphology), and words into sentences/utterances (syntax), all of which yields meaning and conceptual knowledge (semantics) and can be used in social situations (pragmatics). We can expect, then, that DLD will impact language skills across modalities, and this is indeed what the evidence shows. Children with DLD have been found to have difficulties with oral language comprehension [39], oral expression [60], reading comprehension [57], and written composition [54]. Written language may be especially challenging for those with DLD because of the greater complexity of text vs. oral language. Book language is lexically denser, more lexically diverse, and comprises a larger proportion of rarer and more abstract words compared to spoken language [12]. Compared to oral language, text is also more grammatically complex with sentences often including long and complex phrases, relative clauses, and multiclausal subordinations [29]. The oral and written language and learning difficulties experienced by children with DLD mean that they often struggle with academic learning across the curriculum. In school, language is the medium of learning: teachers give instructions using oral and written language, and students use oral and written language to acquire information and demonstrate their learning. In a recent review, children with DLD were found to have particular difficulties with verbally-based math activities like number transcoding, counting, arithmetic and story problem tasks [10]. Similar challenges have been noted for children with DLD in science [41] and across curricular areas [66].

Table 1 Factors that could distinguish DLD and specific learning disorder

Key factors	Developmental language disorder	Specific learning disorder
How skills are learned	Language is largely acquired implicitly without formal instruction	Academic learning requires formal instruction, effort & lots of practice
When skills are learned	Early in development, although difficulties may not be recognized or diagnosed	Arises during school years, although difficulties may not be apparent until educational demands exceed individual's capacity
Relationship to oral language	DLD is a difficulty with language. Oral language difficulties are a hallmark of the disorder	Oral language impairments are not part of the diagnosis. Some manifestations related to the academic learning difficulty could manifest in oral language (e.g., poor vocabulary related to not reading)
Relationship to written language	Language is language regardless of the modality ¹ (i.e., oral or written). DLD will impact written language including reading comprehension & written composition	Written (but not oral) language is considered an academic skill ² . Specific Learning Disorder will have a much greater impact on written language skills, and/or other academic skills

1—Snow [53], 2—Fletcher et al. [20]

In contrast to DLD, Specific Learning Disorder affects the academic subjects of reading, writing, and math. Written language difficulties will be a hallmark feature of the disorder, in the majority of cases. As noted, learning to read, write, and do math is not a natural process; it requires formal instruction in recognizing, understanding, forming, and remembering arbitrary written symbols and symbol sequences, as well as understanding and producing extended text and mathematical problems. In a recent meta-analysis, Wagner et al. [61] found that word reading and oral language (listening) comprehension alone account for only half of the variance in predicting children's reading comprehension. Beyond lexical and linguistic knowledge, knowledge and processes essential for reading comprehension include general knowledge, knowledge of text structure, inferencing, comprehension monitoring, and working memory capacity [20, 48]. It is important to note that many of these skills are still language-related, but are particularly relevant to written language. For example, reading comprehension relies on inferencing because of the acontextual nature of written language. Specifically, inferencing requires combining explicit statements (i.e., language) from the text with general knowledge already known by the reader in order to create a coherent representation of the text in memory [43]. In writing, executive functions support the necessary controlled attention, goal setting, planning, organizing, and self-monitoring required for written composition, and working memory supports the cognitive flow of the work during composing and revising [3]. In the area of math, domain-specific skills have been found to support numerosity [63], mathematical procedures [21] and mathematical computations [20]. We can expect that weaknesses in the skills particularly important to the development of written language and math will be associated with Specific Learning Disorder, and indeed, these associations are found. For example, impairments in executive functions [9] and inferencing [27] are commonly observed in children with Specific Learning Disorder. In contrast, oral language difficulties are not part of the Specific Learning Disorder profile. Some oral language weaknesses may be observed [24], and may be related to the academic struggles such as weak vocabulary knowledge due to lower reading experience [34] and social communication problems related to executive processes [28]. Oral language difficulties related to core linguistic deficits (e.g., morphology, syntax, however, would not be expected [28].

In summary, DLD is a difficulty acquiring language often identifiable around 4 years of age and impacting language across modalities and curricular subjects, whereas Specific Learning Disorder is a difficulty with academic learning through formal instruction lasting a minimum of 6 months and impacting written language, math, and other subjects. Even though these distinctions seem clear, it can be challenging to differentiate DLD and Specific Learning Disorder. First, it may be difficult to know when manifestations were first observed. For example, there may be no record of language difficulties prior to the beginning of formal instruction because DLD is often undiagnosed [46]. Similarly, Specific Learning Disorder may not be diagnosed in a timely manner either because of service waitlists or a wait-to-fail approach [59]. Second, there is considerable overlap in the processes supporting language and academic learning, which can make it challenging to determine if the underlying difficulties are related to linguistic or learning processes. Finally, it can be difficult to distinguish the two disorders because they commonly co-occur [42]. The DSM-5 lists each disorder as potentially comorbid with the other disorder, except with the caveat that a dual diagnosis would only be given if a thorough assessment indicates each disorder independently interferes with daily activities including learning. Notably, the differential characteristics of DLD and one particular Specific Learning Disorder, dyslexia, have been studied in the most detail. Dyslexia and DLD are considered distinct disorders but with estimated comorbidity rates around 50% [1]. It has been proposed [7] that dyslexia is characterized by phonological deficits and DLD by language deficits outside the phonological domain (e.g., vocabulary, morphology, syntax).

4 Specific learning disabilities and language-based learning disabilities

Before we turn to the terms *Specific Learning Disability* and *Language-Based Learning Disability* and how they relate to DLD and Specific Learning Disorder, a review of the terms disorder and disability is warranted. The term 'disorder' refers to a condition with a presumed biological origin but often for which no specific cause is known (i.e., no pathological or disease state is identified), and which impairs individual functioning and impacts performance. Disability, on the other hand, captures the mismatch between an individual's capacities and the context in which the person is to function [62]. According to the *International Classification of Functioning Disability and Health* (ICF; [33]), disability is not an individual's intrinsic feature but arises due to interactions in an environment. The disability is a state of functioning between personal capacity and the demands of an environment or task. The focus on the gap is important because it shifts the emphasis from an individual's problem to the person's strengths and how to change demands of the context to ensure their success.

The term disability is used in educational contexts. Children with disabilities are eligible to receive the educational accommodations, modifications, or adjustments necessary to access effective, quality education and learn, a right recognized in many countries [13, 14, 17, 47, 58]. Defining children's disabilities, however, is another matter. The ICF provides universal indicators of body functions and structures (e.g., mental functions), activities and participation (e.g., learning and applying knowledge), and environmental factors (e.g., services, systems, and policies) that together determine disability, however specific criteria for identifying or quantifying children's language and learning disabilities are not included. Each country, sometimes each region (e.g., in Australia), province (e.g., in Canada) or state (e.g., in the USA), writes their own definition or criteria for who has a disability requiring educational supports. Given this understanding, let us examine definitions of Specific Learning Disability in relation to DLD and Specific Learning Disorder beginning with legislation in the United States and then drawing comparisons to other English-speaking countries.

In the United States, the Individual with Disabilities Education Act [31, 32] is a law that governs how states and public agencies provide early intervention, education, and related services to students with disabilities. Categories of disabilities are defined not to provide a medical diagnosis (as is the case for the DSM-5) but to identify those requiring special education. A child with a disability is defined as a child evaluated as having one of 13 listed disabilities, and who, by reason thereof, needs special education (specially designed instruction) and related services (as required to benefit from special education). Included in the 13 disability terms are *Specific Learning Disability* and *Speech or Language Impairment*. The latter describes 'a communication disorder such as ... a language impairment ... that adversely affects a child's educational performance' (IDEA, Sect. 300.8.c11), which clearly includes DLD. Consider the definition of Specific Learning Disability in detail:

Specific Learning Disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. [IDEA, Section 300.8.c10]

At first glance, it seems that this definition of Specific Learning Disability entirely conflates DLD and Specific Learning Disorder. The problem giving rise to the disability is with basic psychological processes involved in understanding or using language (i.e., DLD) that manifests itself as difficulties with reading, writing, spelling, or doing math (i.e., Specific Learning Disorder). However, this confusion only arises if we are expecting Specific Learning Disability to be an educational synonym for the medical diagnosis of Specific Learning Disorder. If, instead, we examine the distinction between disability and disorder as they are used in the definition, we can appreciate the differences between Specific Learning Disorder and Specific Learning Disability and gain clarity. As defined, Specific Learning Disability requires the presence of a disorder with manifestations in a variety of academically-related (e.g., listening, thinking, speaking) and academic domains (e.g., reading, writing, math). The disability, then, arises from the mismatch between the capacity for learning and the educational requirement or context, as evidenced by the need for instructional modifications (i.e., special education and related services). Crucially, Specific Learning Disorder is the diagnosed condition describing a persistent difficulty learning and using academic skills whereas Specific Learning Disability is the problem created by the mismatch between the condition and educational demands. It is unfortunate that despite their distinction, these terms overlap so closely, which perpetuates confusion and makes it challenging to use the terms with precision. A Specific Learning Disorder can cause a Specific Learning Disability, but so can many other disorders including perceptual disabilities, brain injury, and DLD (i.e., developmental aphasia). The list in the definition is not exhaustive. For example, a child with attention deficit hyperactivity disorder (ADHD) may be found to have a Specific Learning Disability if the ADHD adversely affects the child's educational performance [30]. The advantage of specifying the indicated disorder is that the disorder can bring understanding and indications for intervention.

A second potential confusion with the IDEA definition for Specific Learning Disability is the focus on language processes. Specifically, the relevant disorder is in one or more of the basic psychological processes involved in understanding or producing spoken or written language. The relationship to language is further implicated in the inclusion of listening and speaking as manifestations of the disability. Fletcher et al. [20] described problems with speaking (oral expression) and listening (comprehension) as essentially oral language disorders, which are incorporated under the disability category of speech and language impairment. They argued further that listening and speaking are not formal areas of academic achievement, and that their inclusion in the definition of Specific Learning Disability leads to conceptual confusion. Nevertheless, the centrality of language to the definition of Specific Learning Disability recognizes that a broad range of language-related processes are implicated in academic learning. The vast majority of academic learning disabilities are language-based learning disabilities [25], whether their underlying disorder is DLD, Specific Learning Disorder, or

something else (e.g., ADHD). Essentially, the definition of Specific Learning Disability does not attempt to separate language and academic learning, but rather recognizes that disorders in these areas impact educational participation and achievement by restricting the abilities to listen, think, speak, read, write, spell, or to do mathematical calculations. As described previously, DLD and Specific Learning Disorder are distinguished based on when and how the relevant skills are acquired, and the greater focus on written language in the case of Specific Learning Disorder. The purpose of defining Specific Learning Disability, on the other hand, is to identify children experiencing difficulties with school learning, which are known to be associated with language processing problems due to a variety of disorders.

A final point regards the overlap between the Specific Learning Disability and Speech and/or Language Impairment disabilities in the IDEA. We have already seen that children with DLD could be identified under either of these categories, which would seem to create another point of confusion. Indeed, in the United States, the designation of Speech and/or Language Impairment is more common than Specific Learning Disability in students up to 9 years of age, but the pattern reverses after that [22]. It seems likely that younger children with DLD are identified as having a Speech and/or Language Impairment before success in core academic domains is clear whereas older children with DLD who show evidence of academic difficulties are identified as having a Specific Learning Disability. It may be that Specific Learning Disability is the preferred term for older children due to the greater specification of academic impacts included in the definition for Specific Learning Disability (i.e., listen, think, speak, read, write, spell, or to do mathematical calculations) as compared to Language Impairment (i.e., affects educational performance). If this is the case, it would be important for parents to understand that their child's underlying condition has not changed (i.e., they have not acquired a second disorder), but that the manifestation of their DLD has changed over time leading to the additional identification of Specific Learning Disability [55]. Many of the same overlaps appear in corresponding definitions from other organizations around the world (see Supplemental Materials 1).

To summarize, DLD and Specific Learning Disorder are disorders causing difficulties in learning to read, write, and do mathematics. As a result of these disorders, a Specific Learning Disability (sometimes referred to as a Language-based Learning Disability) may arise due to a mismatch between a child's capacity for learning and educational requirements. Children with a Specific Learning Disability are likely to require educational accommodations, modifications, or adjustments to reduce the gap between their personal capacity and educational demands, and optimize their state of functioning. Children with DLD might also or alternatively be identified as having a Language Impairment (Speech and/or Language impairment; Speech, Language, and Communication Needs). It would be useful to identify both Language Impairment and Specific Learning Disability when relevant for particular children in order to highlight the child's language needs in interventions.

5 Implications for practice

Language and learning are inextricably tied. A child learns language, but also uses language to learn. Distinguishing difficulties with language or learning processes as contributing to a child's academic performance is challenging at best, and probably impossible at times. The problem is made even more challenging by the use of different and overlapping terms. One source of confusion is the interchangeable use of the terms Specific Learning Disorder and Specific Learning Disability, which has resulted in these terms being considered largely synonymous in practice. In fact, Specific Learning Disorder and Developmental Language Disorder (DLD) are related to Specific Learning Disability in the same way: both are conditions causing a Specific Learning Disability under certain conditions (i.e., when the educational environment requires performance beyond the child's capacity). Unfortunately, the overlap in terms lends itself to the mistaken conclusion that only a Specific Learning Disorder causes a Specific Learning Disability when in fact, a variety of conditions (i.e., Specific Learning Disorder, DLD, and others) may be implicated. The connection of DLD to Specific Learning Disability can be confusing in light of the fact that a disability due to a language disorder is also often captured under a separate disability category, Language Impairment (or Speech, Language, Communication Needs). In many cases, however, these latter designations do not capture the full educational impact of DLD across the curriculum. Possible policy solutions for these confusions would be to rename Specific Learning Disability to reduce overlap with Specific Learning Disorder, narrow the focus of Specific Learning Disability to academic learning, and/or expand the definitions of Language Impairment to specifically include impacts across modalities (i.e., reading, writing, spelling, math).

The terms Language Disorder, Developmental Language Disorder, Language-based learning disabilities, Specific Learning Disorder, and Specific Learning Disability are commonly used to describe children who are struggling to learn at

school. It is important that these terms be used with precision in order to help families and educational teams understand the child's difficulty and design intervention accordingly. At this time, Specific Learning Disorder and Specific Learning Disability are often used synonymously despite their nuanced differences, and the problem is exacerbated by their shared acronym. The association between DLD and Specific Learning Disability, on the other hand, is often not recognized. Many of the skills underlying academic learning are language-based leading to the use of the term Language-based Learning Disability. In this paper, I suggest that DLD and Specific Learning Disorder can be distinguished based on when and how the relevant information is learned, and considering whether the learning impacts processes uniquely supporting written language. Importantly, both of these conditions are likely to result in a Specific Learning Disability, but the focus of the intervention response will be informed by the underlying condition. In the end, that's what matters most: designing an intervention to fit the needs of the child.

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Declarations

Competing interests The author declares the following competing interests: The author maintains the 'The DLD Diagnostics Toolbox', a virtual collection of guides for diagnosing Developmental Language Disorder. Volume 6 of the DLD Toolbox focuses on the topic addressed in this work: https://www.uwo.ca/fhs/lwm/news/2022/02_16_DLDSL.html

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References

1. Adlof SM, Hogan TP. Understanding dyslexia in the content of developmental language disorder. *Lang Speech Hear Serv Sch*. 2018;49:762–73. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0049.
2. American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
3. Berninger VW, Winn WD. Implications of Advancements in Brain Research and Technology for Writing Development, Writing Instruction, and Educational Evolution. In: MacArthur CA, Graham S, Fitzgerald J, editors. *Handbook of Writing Research*. The Guilford Press; 2006. p. 96–114.
4. Bishop DVM. Ten questions about terminology for children with unexplained language problems. *Int J Lang Commun Disord*. 2014;49:381–415. <https://doi.org/10.1111/1460-6984.12101>.
5. Bishop DVM, Snowling MJ, Thompson PA, Greenhalgh T, et al. CATALISE: a multinational and multidisciplinary delphi consensus study. Identifying language impairments in children. *PLoS ONE*. 2016;11:e0158753. <https://doi.org/10.1371/journal.pone.0158753>.
6. Bishop DVM, Snowling MJ, Thompson PA, Greenhalgh T. Phase 2 of CATALISE: a multinational and multidisciplinary delphi consensus study of problems with language development: terminology. *J Child Psychol Psychiatry*. 2017;58:1068–80. <https://doi.org/10.1111/jcpp.12721>.
7. Catts HW, Adlof SM, Hogan TP, Weismer SE. Are specific language impairment and dyslexia distinct disorders? *J Speech Lang Hear Res*. 2005;48:1378–96. [https://doi.org/10.1044/1092-4388\(2005\)096](https://doi.org/10.1044/1092-4388(2005)096).
8. Conti-Ramsden G, Durkin K, Toseeb U, Botting N, Pickles A. Education and employment outcomes of young adults with a history of developmental language disorder. *Int J Lang Commun Disord*. 2018;53:237–55. <https://doi.org/10.1111/1460-6984.12338>.
9. Crisci G, Caviola S, Cardillo R, Mammarella IC. Executive functions in neurodevelopmental disorders: comorbidity overlaps between Attention Deficit and Hyperactivity Disorder and Specific Learning Disorders. *Front Hum Neurosci*. 2021;15: 594234. <https://doi.org/10.3389/fnhum.2021.594234>.
10. Cross AM, Joannisse MF, Archibald LMD. Mathematical abilities in children with Developmental Language Disorder. *Lang Speech Hear Serv Sch*. 2019;50:150–63. https://doi.org/10.1044/2018_LSHSS-18-0041.
11. Dale PS, Price T, Bishop DVM, Plomin R. Outcomes of early language delay: 1 Predicting persistent and transient language difficulties at 3 and 4 years. *J Speech Lang Hear Res*. 2003;46:544–60. [https://doi.org/10.1044/1092-4388\(2003\)044](https://doi.org/10.1044/1092-4388(2003)044).
12. Dawson N, Hsiao Y, Banerji N, Tan AWM, Nation KA. Features of lexical richness in children's books: comparisons with child-directed speech. *Lang Dev Res*. 2021;1:9–53. <https://doi.org/10.34842/5we1-yk94>.

13. Department of Education (2013). For Each and Every Child. A Strategy for Education Equity and Excellence. United States. <https://oese.ed.gov/resources/oese-technical-assistance-centers/state-support-network/resources/every-child-strategy-education-equity-excellence/>
14. Department of Education. (2016). Education Excellence Everywhere. A white paper setting out our vision for schools in England. United Kingdom. <https://www.gov.uk/government/publications/educational-excellence-everywhere>
15. DeSmedt B, Taylor J, Archibald LMD, Ansari D. How is phonological processing related to individual differences in children's arithmetic skills? *Dev Sci*. 2010;13:508–20. <https://doi.org/10.1111/j.1467-7687.2009.00897.x>.
16. Dubois P, St-Pierre M-C, Desmarais C, Guay F. Young adults with developmental language disorder: a systematic review of education, employment, and independent living outcomes. *J Speech Lang Hear Res*. 2020;63(11):3786–800. https://doi.org/10.1044/2020_JSLHR-20-00127.
17. Education for All. (2015). National Review Report: Kenya. For further information, please contact: efa2015reviews@unesco.org.
18. Ellis N. Implicit AND explicit language learning: Their dynamic interface and complexity. In: Rebuschat P, editor. *Implicit and explicit learning of languages*. John Benjamins; 2015. p. 3–23.
19. Farnia F, Geva E. Late-emerging developmental language disorders in English-speaking monolinguals and English-language learners: a longitudinal perspective. *J Learn Disabil*. 2019;52:468–79.
20. Fletcher JM, Lyonm GR, Barnes M, Stuebing KK, Francis DJ, Olson RK, Shaywitz SE, Shaywitz BA. Classification of learning disabilities: An evidence-based evaluation. In: Bradley R, Danielson L, Hallahan DP, editors. *Identification of Learning Disabilities: Research to Practice*. Lawrence Erlbaum Associates Publishers; 2002. p. 185–250.
21. Geary DC, Hoard MK. Numerical and arithmetical deficits in learning-disabled children: relation to dyscalculia and dyslexia. *Aphasiology*. 2001;15:635–47. <https://doi.org/10.1080/02687040143000113>.
22. Georgan WC, Archibald LMD, Hogan TP. Speech/language impairments or specific learning disability? Examining the usage of educational labels. *J Speech Lang Hear Res*. 2023;66:656–67.
23. Gerber PJ. The impact of learning disabilities on adulthood: a review of the evidence-based literature for research and practice in adult education. *J Learn Disabil*. 2012;45:31–46. <https://doi.org/10.1177/0022219411426858>.
24. Government of Ireland (2004). Education for Persons with Special Educational Needs Act (2004). Ireland. <https://data.oireachtas.ie/ie/oireachtas/act/2004/30/eng/enacted/a3004.pdf>
25. Grigorenko EL (2012) Language-Based Learning Disabilities. In N.M. Seel (eds) *Encyclopedia of the Sciences of Learning*. Springer. https://doi.org/10.1007/978-1-4419-1428-6_734
26. Grigorenko EL, Compton DL, Fuchs LS, Wagner RK, Willcutt EG, Fletcher JM. Understanding, educating, and supporting children with specific learning disabilities: 50 years of science and practice. *Am Psychol*. 2020;75:37–51. <https://doi.org/10.1037/amp0000452>.
27. Hall C, Barnes MA. Inference instruction to support reading comprehension for elementary students with learning disabilities. *Interv Sch Clin*. 2017;52:279–86. <https://doi.org/10.1177/1053451216676799>.
28. Hawkins, E., Gathercole, S., Astle, D., The CALM Team, & Holmes, J. Language problems and ADHD symptoms: how specific are the links? *Brain Sci*. 2016;6:50. <https://doi.org/10.3390/brainsci6040050>.
29. Hsiao Y, Dawson NJ, Banerji N, Nation K. The nature and frequency of relative clauses in the language children hear and the language children read: a developmental cross-corpus analysis of English complex grammar. *J Child Lang*. 2022. <https://doi.org/10.1017/S0305000921000957>.
30. Individuals With Disabilities Education Act. Policy letter: March 30, 2001 to Colorado Department of Special Education Director, Dr. Lorrie Harkness; 2001. <https://sites.ed.gov/idea/idea-files/policy-letter-march-30-2001-to-colorado-department-of-education-special-education-director-dr-lorrie-harkness/>
31. Individuals With Disabilities Education Act, 20 U.S.C. § 1400; 2004.
32. Individuals With Disabilities Education Act (2004). Section 300.8 Child with a disability. <https://sites.ed.gov/idea/regs/b/a/300.8>
33. International Classification of Functioning, Disability, and Health: ICF. Geneva: World Health Organization; 2001.
34. Joshi RM. Vocabulary: a critical component of comprehension. *Read Writ Q*. 2005;21:209–19. <https://doi.org/10.1080/10573560590949278>.
35. Kaihara C, Shibata K. Redefinition of language learning disabilities and the ways to learn English as a second language. *Pacific Rim International Conference on Disability and Diversity Conference Proceedings*. Center on Disability Studies, University of Hawai'i; 2020.
36. Koponen T, Salmi P, Eklund K, Aro T. Counting and RAN: Predictors of arithmetic calculation and reading fluency. *J Educ Psychol*. 2013;105(1):162–75. <https://doi.org/10.1037/a0029285>.
37. Kornev A, Balčiūienė I. Lexical and grammatical errors in developmentally language disordered and typically developed children: the impact of age and discourse genre. *Children*. 2021;8:1114. <https://doi.org/10.3390/children8121114>.
38. Lancaster HS, Camarata S. Reconceptualizing developmental language disorder as a spectrum disorder: issues and evidence. *Int J Lang Commun Disord*. 2019;54:79–94. <https://doi.org/10.1111/1460-6984.12433>.
39. Law J, Tomblin JB, Zhang X. Characterizing the growth trajectories of language-impaired children between 7 and 11 years of age. *J Speech Lang Hear Res*. 2008;51:739–49. [https://doi.org/10.1044/1092-4388\(2008/052\)](https://doi.org/10.1044/1092-4388(2008/052)).
40. Law J, Rush R, Schoon I, Parsons S. Modeling developmental language difficulties from school entry into adulthood: literacy, mental health, and employment outcomes. *J Speech Lang Hear Res*. 2009;52:1401–16. [https://doi.org/10.1044/1092-4388\(2009/08-0142\)](https://doi.org/10.1044/1092-4388(2009/08-0142)).
41. Lowe H, Henry L, Joffe VL. The effectiveness of classroom vocabulary intervention for adolescents with language disorder. *J Speech Lang Hear Res*. 2019;62:2829–46. https://doi.org/10.1044/2019_JSLHR-L-18-0337.
42. Margari L, Buttiglione M, Craig F, Cristella, A., de Giambattista, C., Matera, E., Operto, F., & Simone, M. Neuropsychological comorbidities in learning disorders. *BMC Neurol*. 2013;13:198. <https://doi.org/10.1186/1471-2377-13-198>.
43. McKoon G, Ratcliff R. Inference during reading. *Psychol Rev*. 1992;99(3):440–66. <https://doi.org/10.1037/0033-295X.99.3.440>.
44. Mugnaini D, Lassi S, La Malfa G, Albertini G. Internalizing correlates of dyslexia. *World J Pediatr*. 2009;5:255–64. <https://doi.org/10.1007/s12519-009-0049-7>.
45. Nippold MA. Language disorders in adolescents: Current needs and future directions. *Semin Speech Lang*. 2016;37:274–9. <https://doi.org/10.1055/s-0036-1587705>.

46. Norbury CF, Gooch D, Wray C, Baird G, Charman T, Simonoff E, Vamvakas G, Pickles A. The impact of nonverbal ability on prevalence and clinical presentation of language disorder: evidence from a population study. *J Child Psychol Psychiatry*. 2016;57:1247–57. <https://doi.org/10.1111/jcpp.12573>.
47. Ontario Ministry of Education. Learning for All. A guide to effective assessment and instruction for all students, kindergarten to grade 12. Ontario Ministry of Education; 2013.
48. Perfetti C, Stafura J. Word knowledge in a theory of reading comprehension. *Sci Stud Read*. 2014;18(1):22–37. <https://doi.org/10.1080/10888438.2013.827687>.
49. Peters L, Ansari D. Are specific learning disorders truly specific, and are they disorders? *Trends Neurosci Educ*. 2021;17:100115. <https://doi.org/10.1016/j.tine.2019.100115>.
50. Redmond SM. Clinical intersections among idiopathic language disorder, social (pragmatic) communication disorder, and attention-deficit hyperactivity disorder. *J Speech Lang Hear Res*. 2020;63:3263–76. https://doi.org/10.1044/2020_JSLHR-20-00050.
51. Regier DA, Goldberg DP, Üstün BT, Reed GM. DSM-5 and ICD-11 classifications. In: Geddes JR, Andreasen NC, Goodwin GM, eds. *New Oxford Textbook of Psychiatry*. Oxford Academic; Oxford; 2011.
52. Share DL. Common misconceptions about the phonological deficit theory of dyslexia. *Brain Sci*. 2021;11:1510. <https://doi.org/10.3390/brainsci11111510>.
53. Snow P. Elizabeth usher memorial lecture: language is literacy is language—positioning speech-language pathology in education policy, practice, paradigms and polemics. *Int J Lang Commun Disord*. 2016;18:216–28.
54. Stoeckel RE, Colligan RC, Barbaresi WJ, Weaver AL, Killian JM, Katusic SK. Early speech-language impairment and risk for written language disorder: a population-based study. *J Dev Behav Pediatr*. 2013;34:38–44. <https://doi.org/10.1097/DBP.0b013e31827ba22a>.
55. Sun L, Wallach GP. Language disorders are learning disabilities: challenges on the divergent and diverse paths to language learning disability. *Top Lang Disord*. 2014;34:25–38. <https://doi.org/10.1097/TLD.0000000000000005>.
56. Tannock R. Rethinking ADHD and LD in DSM-5: Proposed changes in diagnostic criteria. *J Learn Disabil*. 2012;46:5–25. <https://doi.org/10.1177/0022219412464341>.
57. Tomblin JB, Zhang X, Buckwalter P, Catts H. The association of reading disability, behavioral disorders, and language impairment among second-grade children. *J Child Psychol Psychiatry*. 2000;41:473–82. <https://doi.org/10.1111/1469-7610.00632>.
58. United Nations Convention on the Rights of Persons with Disabilities. (2006). Retrieved from <http://www.un.org/dis-abilities/convention/conventionfull.shtml>
59. Vaughn S, Fuchs LS. Redefining learning disabilities as inadequate response to instruction: the promise and potential problems. *Learn Disabil Res Pract*. 2003;18:137–46. <https://doi.org/10.1111/1540-5826.00070>.
60. Visser-Bochane MI, Gerrits E, van der Schans CP, Reijneveld SA, Luinge MR. Atypical speech and language developmental: a consensus study on clinical signs in the Netherlands. *Int J Lang Commun Disord*. 2017;52:10–20. <https://doi.org/10.1111/1460-6984.12251>.
61. Wagner RK, Beal B, Zirps FA, Spencer M. A model-based meta-analytic examination of specific reading comprehension deficit: how prevalent is it and does the simple view of reading account for it? *Ann Dyslexia*. 2021;71:260–81. <https://doi.org/10.1007/s11881-021-00232-2>.
62. Wehmeyer ML. Disability, disorder, identity. *Intellect Dev Disabil*. 2013;51:122–8. <https://doi.org/10.1352/1934-9556-51.2.122>.
63. Wilson AJ, Andrewes SG, Structures H, Rowe VM, Bogdanovic R, Waldie KE. Dyscalculia and dyslexia in adults: cognitive bases of comorbidity. *Learn Individ Differ*. 2015;37:118–32. <https://doi.org/10.1016/j.lindif.2014.11.017>.
64. World Health Organization. *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization; 1992.
65. World Health Organization. *International Statistical Classification of Diseases and Related Health Problems*; 2019. (11th ed.). <https://icd.who.int/>
66. Young AR, Beitchman JH, Johnson C, Douglas L, Atkinson L, Escobar M, Wilson B. Young adult academic outcomes in a longitudinal sample of early language impaired control children. *J Child Psychol Psychiatry*. 2002;43:635–45. <https://doi.org/10.1111/1469-7610.00052>.

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