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Le droit d'apprendre, la possibilité de réussir!*

Position Paper

TO REVISE OR NOT TO REVISE:

The Official LDAC Definition of Learning Disabilities

Versus

DSM-5 Criteria

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LDAC Research Committee: DSM 5 Ad-Hoc Committee

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Introduction

The latest version of the Diagnostic and Statistical Manual of Mental Disorders; Fifth Edition (DSM-5) published May 2013, includes the diagnostic criteria and features of Specific Learning Disorder. Many of the criteria are consistent with the LDAC Definition of Learning Disabilities, which has had longstanding endorsement by the Learning Disabilities Association of Canada (LDAC) as well as provincial and territorial Learning Disabilities Associations and Chapters across Canada. However, there are DSM-5 criteria at variance with the LDAC Definition of Learning Disabilities and the LDAC will need to consider whether the current definition should be more aligned with the DSM-5. Therefore, the challenging issue is: “To Revise or Not to Revise”. To facilitate decision-making around this critical question, an Ad Hoc Committee has taken on the responsibility of identifying some of the key similarities and differences in both perspectives. In this paper, the following has been addressed:

- A brief description of the DSM-5.
- The LDAC Definition of Learning Disabilities.
- A comparison of the LDAC Definition of Learning Disabilities and the DSM-5 Specific Learning Disorder.
- Discussion of key differences between the two perspectives including: intelligence testing; IQ versus academic discrepancy model and cognitive processing.
- A brief description of the ICD, another classification system that includes Learning Disorders.
- Reference to what the research indicates on these issues.
- Conclusions and Recommendations.

What is the DSM?

The Diagnostic and Statistical Manual of Mental Disorders (DSM) is published by the American Psychiatric Association and contains descriptions of symptoms and criteria for diagnosing a wide range of disorders for both children and adults. Mental health practitioners primarily use it as a guide in determining accuracy and consistency in diagnosis. However, there is overlap in its use among professionals in educational and therapeutic settings that provide evaluation and treatment service to individuals of all ages, including those with learning disabilities.

LDAC Definition of Learning Disabilities

In 1996, the Learning Disabilities Association of Canada convened a panel of Canadian experts to review and summarize the considerable research literature on learning disabilities, the results of which were published in 2001 (Fiedorowicz et al., 2001). Based on research at that time, and in conjunction with the development of the 2001 LDA Ontario definition, a new national definition of learning disabilities was developed and in 2002 was ratified by its membership from every province and territory in Canada. This definition encompassed the whole spectrum of Learning Disabilities (LD). The full verbatim definitions of both

the LDAC LD definition and key features of excerpts of the DSM-5 Specific Learning Disorder can be found in Table 1 below.

Table 1: A Comparison of the verbatim LDAC Definition and excerpts of the DSM-5 Specific Learning Disorder Criteria

LDAC LD Definition	DSM-5 Specific Learning Disorder
<p>Learning Disabilities refer to a number of disorders, which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information.</p>	
<p>These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency.</p>	<p>The learning difficulties are no better accounted for by intellectual disabilities.</p>
<p>Learning disabilities result from impairments in one or more processes related to perceiving, thinking, remembering or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).</p>	<p>Individuals with Specific Learning Disorder typically (but not invariably) exhibit poor performance on psychological tests of cognitive processing. However, it remains unclear whether these cognitive abnormalities are the cause, correlate, or consequence of the learning difficulties. Thus, assessment of cognitive processing deficits is not required for diagnostic assessment. There are no known biological markers of specific learning disorder. As a group, individuals with the disorder show circumscribed alterations in cognitive processing and brain structure and function. Genetic differences are also evident at the group level. But cognitive testing, neuroimaging, or genetic testing are not useful for diagnosis at this time.</p>
<p>Learning disabilities range in severity.</p>	<p>Specify current severity:</p> <p>Mild: Some difficulties with learning skills in one or two academic domains, but of mild enough severity that the individual may be able to compensate or function well when provided with appropriate accommodations or support services, especially during the school years.</p> <p>Moderate: Marked difficulties with learning skills in one or more academic domains, so that the individual is unlikely to become proficient without some intervals of intensive and specialized teaching during the school years.</p>

LDAC LD Definition	DSM-5 Specific Learning Disorder
	<p>Some accommodations or supportive services at least part of the day at school, in the workplace, or at home may be needed to complete activities accurately and efficiently.</p> <p>Severe: Severe difficulties with learning skills, affecting several academic domains, so that the individual is unlikely to learn those skills without ongoing intensive individualized and specialized teaching for most of the school years. Even with an array of appropriate accommodations or services at home, at school, or in the workplace, the individual may not be able to complete all activities efficiently.</p>
<p>May interfere with the acquisition and use of one or more of the following:</p> <ul style="list-style-type: none"> • oral language (e.g. listening, speaking, understanding); • reading (e.g. decoding, phonetic knowledge, word recognition, comprehension); • written language (e.g. spelling and written expression); and • mathematics (e.g. computation, problem-solving). 	<p>Difficulties with learning and academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties:</p> <ol style="list-style-type: none"> 1. Inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guesses words, has difficulty sounding out words). 2. Difficulty understanding the meaning of what is read (e.g., may read test accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read). 3. Difficulties with spelling (e.g., may add, omit, or substitute vowels or consonants). 4. Difficulties with written expression (e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity). 5. Difficulties mastering number sense, number facts, or calculation (e.g., has poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact as peers do; gets lost in the midst of arithmetic computation and may switch procedures). 6. Difficulties with mathematical reasoning (e.g., has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems).

LDAC LD Definition	DSM-5 Specific Learning Disorder
	<p><i>Specify it:</i></p> <p>315.00 (FS1.0) With Impairment in reading:</p> <ul style="list-style-type: none"> Word reading accuracy Reading rate or fluency Reading comprehension <p>Note: <i>Dyslexia</i> is an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities. If dyslexia is used to specify this particular pattern of difficulties, it is important also to specify any additional difficulties that are present, such as difficulties with reading comprehension or math reasoning.</p> <p>315.2 (F81.81) With Impairment in written expression:</p> <ul style="list-style-type: none"> Spelling accuracy Grammar and punctuation accuracy Clarity or organization of written expression <p>315.1 (F81.2) With Impairment in mathematics:</p> <ul style="list-style-type: none"> Number sense Memorization of arithmetic facts Accurate or fluent calculation Accurate math reasoning <p>Note: <i>Dyscalculia</i> is an alternative term used to refer to a pattern of difficulties characterized by problems processing numerical information, learning arithmetic facts, and performing accurate or fluent calculations. If dyscalculia is used to specify this particular pattern of mathematic difficulties, it is important also to specify any additional difficulties that are present, such as difficulties with math reasoning or word reasoning accuracy.</p> <p>This criterion also requires psychometric evidence from an individually administered, psychometrically sound and culturally appropriate test of academic achievement that is norm-referenced or criterion-referenced.</p>
<p>Learning disabilities may also involve difficulties with organizational skills, social perception, social interaction and perspective taking.</p>	

LDAC LD Definition	DSM-5 Specific Learning Disorder
<p>Learning disabilities are lifelong. The way in which they are expressed may vary over an individual's lifetime, depending on the interaction between the demands of the environment and the individual's strengths and needs.</p>	<p>The learning difficulties begin during school-age years but may not become fully manifest until the demands for those affected academic skills exceed the individual's limited capacities (e.g., as in timed tests, reading or writing lengthy complex reports for a tight deadline, excessively heavy academic loads).</p> <p>Changes in manifestation of symptoms occur with age, so that an individual may have a persistent or shifting array of learning difficulties across the lifespan.</p>
<p>Learning disabilities are suggested by unexpected academic under-achievement or achievement, which is maintained only by unusually high levels of effort and support.</p>	<p>The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, and cause significant interference with academic or occupational performance, or with activities of daily living, as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment. For individuals age 17 years and older, a documented history of impairing learning difficulties may be substituted for the standardized assessment.</p>
<p>Learning disabilities are due to genetic and/or neurobiological factors or injury that alters brain functioning in a manner, which affects one or more processes related to learning.</p>	<p>Specific learning disorder is a neurodevelopmental disorder with a biological origin that is the basis for abnormalities at a cognitive level that are associated with the behavioral signs of the disorder. The biological origin includes an interaction of genetic, epigenetic, and environmental factors, which affect the brain's ability to perceive or process verbal or nonverbal information efficiently and accurately.</p>
<p>These disorders are not due primarily to hearing and/or vision problems, socio-economic factors, cultural or linguistic differences, lack of motivation or ineffective teaching, although these factors may further complicate the challenges faced by individuals with learning disabilities.</p>	<p>The learning difficulties are not better accounted for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction.</p>
<p>Learning disabilities may co-exist with various conditions including attentional, behavioural and emotional disorders,</p>	<p>Specific learning disorder commonly co-occurs with neurodevelopmental (e.g., ADHD, communication disorders,</p>

LDAC LD Definition	DSM-5 Specific Learning Disorder
<p>sensory impairments or other medical conditions.</p>	<p>developmental coordination disorder, autistic spectrum disorder) or other mental disorders (e.g., anxiety disorders, depressive and/or bipolar disorders). Psychotic disorders - Specific learning disorder is distinguished from the academic and cognitive-processing difficulties associated with schizophrenia or psychosis, because with these disorders there is a decline (often rapid) in these functional domains. If there is an indication that another diagnosis could account for the difficulties in learning keystone academic skills described in Criterion A, specific learning disorder should not be diagnosed.</p>
<p>For success, individuals with learning disabilities require early identification and timely specialized assessments and interventions involving home, school, community and workplace settings. The interventions need to be appropriate for each individual's learning disability subtype and, at a minimum, include the provision of:</p> <ul style="list-style-type: none"> • specific skill instruction; • accommodations; • compensatory strategies; and • self-advocacy skills. 	

Intelligence Testing

The LDAC Definition of Learning Disabilities has clearly stipulated that an individual with learning disabilities has at least average to above average intelligence. This typically has been determined by formal psychological assessments performed by qualified professionals. Learning disabilities have been differentiated from intellectual impairment which was diagnosed when an individual assessed by a qualified professional has a measured IQ at 70 or below on a standardized intellectual test. The distinction between learning disabilities and an intellectual impairment has been considered a key issue as it can provide insights about potential for learning and types of interventions appropriate for each group. Individuals with intellectual impairment are not expected to manage the rigorous interventions appropriate for individuals with learning disabilities at the same level and rate of learning. Differential, targeted interventions and accommodations increase the likelihood of success for each group.

Arguments to not include intelligence evaluations as part of the assessments to determine whether or not an individual has a learning disability include the perspective that individuals of different IQ levels who have a reading disability do

not differ in basic skills related to reading. Individuals with low reading scores who have a discrepancy between their IQ and reading score do not differ in reading skills from poor readers who do not show this discrepancy. Further, some research has indicated that the IQ score does not predict the ability to benefit from remediation.

The field of learning disabilities has long struggled with definition and diagnostic criteria and has been influenced by multiple sectors: education, law, advocacy, and medicine – particularly psychiatry. Predominant models in the learning disabilities field have been:

- IQ-Achievement Discrepancy
- Low Achievement
- Response to Intervention (RTI)
- Cognitive processing strengths and weaknesses

There is notable research to negate one of the more common descriptors for learning disabilities, that of the IQ-Achievement Discrepancy model, which has been found to be flawed. Research has indicated that students with high IQ scores were over-identified, while students with low IQ scores were under-identified. However, healthy debate about the other three models has energized research and is contributing to improved assessment and intervention practices.

One impact of the DSM-5 criterion regarding intelligence testing specifically affecting schools and school psychologists is that IQ testing will no longer be required in order to make the diagnosis of a learning disability, unless intellectual disabilities or general developmental delays are suspected. As well, there will be no requirement for testing of cognitive processes and requested only when useful to guide interventions. Although it has been suggested that with new found time, school psychologists may be more involved in other areas such as offering consultation to individuals, family members and school staff, the negative impact of not including an evaluation of intellectual abilities and cognitive processing needs to be given careful consideration. The unique contribution of psychology to the essential multidisciplinary approach to learning disabilities is the knowledge/skill-set required for assessment, diagnosis and follow-up. In Ontario, for example, it is illegal for any profession other than medicine and psychology to perform the controlled act of diagnosis. Both intellectual assessment and data concerning a range of psychological processes provide a more comprehensive profile of strengths and weaknesses of the individual with learning disabilities and are critical elements of a comprehensive plan for individually targeted intervention and accommodation. Worthy of note, it has also been suggested that it is expected that the DSM-5 changes should make Learning Disabilities “easier” to diagnose. However, the new criteria could increase the risk of false positives and over-diagnosis by including individuals who have academic challenges for reasons other than learning disabilities.

With such an analysis of underlying psychological processes, it is possible to examine the roots of the difficulties, rather than simply restate and validate their existence. The impact of the learning disability throughout an individual’s lifespan can then be better understood.

One challenge posed by the DSM-5 is that 70 +/- 5 is described as a “normal” level of intellectual functioning. There is disagreement about this interpretation and much discussion about what should be considered “average” intellectual functioning. This creates a “gray area” for psychologists and requires flexibility when diagnosing a learning disability. The IQ scores need to be interpreted cautiously in the context of all of the other information gathered about the individual. Processing difficulties experienced by individuals with learning disabilities may have a negative impact on their performance on a test of intelligence. A flexible approach is necessary.

Academic Testing

The following is excerpted from the DSM-5.

One essential feature of specific learning disorder is persistent difficulties learning keystone academic skills (Criterion A), with onset during the years of formal schooling (i.e., the developmental period). A second key feature is that the individual’s performance of the affected academic skills is well below average for age (Criterion B). One robust clinical indicator of difficulties learning academic skills is low academic achievement for age or average achievement that is sustainable only by extraordinarily high levels of effort or support. A third core feature is that the learning difficulties are readily apparent in the early school years in most individuals (Criterion C). However, in others, the learning difficulties may not manifest fully until later school years, by which time learning demands have increased and exceed the individual’s limited capacities. Low achievement scores on one or more standardized tests or subtests within an academic domain (i.e., at least 1.5 standard deviations [SD] below the population mean for age, which translates to a standard score of 78 or less, which is below the 7th percentile) are needed for the greatest diagnostic certainty. However, precise scores will vary according to the particular standardized tests that are used. On the basis of clinical judgment, a more lenient threshold may be used (e.g., 1.0-2.5SD below the population mean for age), when learning difficulties are supported by converging evidence from clinical assessment, academic history, school reports, or test scores. Moreover, since standardized tests are not available in all languages, the diagnosis may then be based in part on clinical judgment of scores on available test measures.

It is noteworthy that the criteria are rather statistically prescriptive. DSM-5 considers “low achievement scores” to be at least 1.5 standard deviations below the population mean for age. As a caution, individual variability and clinical judgment need to be highlighted in determining a diagnosis of learning disabilities. There is a concern that there could be too much reliance on actual numbers, just as there was too much reliance on a statistical calculation in the IQ-Achievement Discrepancy model. Potentially this could be disadvantageous to individuals with learning disabilities. The importance of analyzing the pattern of reading skills, written expression skills or mathematical skills is undervalued, in

that such an analysis can provide information that is highly relevant in understanding the reasons why given interventions may or may not be successful, and where compensatory, rather than remedial options need to be considered. The emphasis with the DSM-5 is on the score and the more qualitative aspect of diagnosis is overlooked.

Cognitive Processing

DSM-5 does not require impairments in cognitive processes related to learning for diagnosis. The diagnostic criteria for a Specific Learning Disorder (SLD) requires the presence of “symptoms ... difficulties learning and using academic skills ... One essential feature of specific learning disorder is persistent difficulties learning keystone academic skills”.

The LDAC definition implicates impairments in “one or more processes related to perceiving, thinking, remembering, or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).”

Cognitive processes go beyond what is measured in standardized IQ tests, although the clusters of abilities assessed by IQ tests can provide valuable information about cognitive abilities and suggest areas of difficulty that warrant further exploration. Academic learning difficulties are logically related to observed deficits in cognitive processes. Examples of cognitive processes under consideration include phonological processing, language processing, attention and memory (working memory, long-term memory and short-term memory), processing speed, visual perception, visual-motor processing, and executive functions.

Although there are limitations in assessment tools for identifying cognitive processing deficits, as there are limitations in our tools for assessing reading, writing, and math, particularly in adults, there are a number of tests that are available to assess cognitive abilities. Further, a comprehensive assessment goes beyond tests and important information can be obtained from observations of the quality of performance, test-teach-test opportunities, interviews, and history. This information, together with a growing body of evidence linking cognitive processing deficits to academic achievement, is important for describing an individual learner’s profile of strengths and needs. It is this profile that is critical for designing intervention for a student with learning disabilities. In clinical practice, there are a wide range of profiles which describe strengths and needs in cognitive and academic areas. Recommendations for intervention are individualized based on the individual’s profile and typically include ideas for teaching approaches, remediation strategies, skills, content, compensatory strategies, accommodations and assistive technology. At a clinical level, the understanding of underlying cognitive processes is important for both classroom and individualized programming. At this stage, there is some scientific evidence to support the efficacy of this approach. More research is necessary to be conclusive but, at the same time, “research does not support shutting the door on the possibility that cognitively focused interventions may eventually prove useful

to chronically nonresponsive students in rigorous efficacy trials” (Fuchs, Hale & Kearns, 2011, p. 102).

Research-based arguments in favour of keeping the focus on cognitive processing as central to the definition include the following:

- Understanding why an individual is struggling with aspects of learning is the most important factor in identification. Assessing the underlying processes that contribute to learning is essential for the development of compensatory strategies, accommodations, self-advocacy, and mental health (including self-esteem, social competence, and positive mood).
- A panel of experts convened by the Learning Disabilities Association of America concluded that “identifying patterns of psychological processing strengths and weaknesses and achievement deficits consistent with this pattern of processing weakness makes the most empirical and clinical sense” (Hale et al., 2010, p. 228).
- Restricting the definition of learning disabilities to academic skills deficits limits the understanding of learning disabilities for everyday life (Scanlon, 2013).
- There is a body of literature that supports associations between cognitive processing deficits and learning disabilities.
 - Hale & Fiorello (2004) promote a concordance-discordance model of learning disability identification (C-DM) that establishes a cognitive strength, a cognitive weakness and an achievement deficit associated with that weakness to generate hypotheses about a child’s processing and learning. Backenson et al (2013) used the C-DM approach in a study of ‘nonverbal LD’ and found processing speed deficits to be central.
 - In a recent meta-analysis, Peng Peng & Fuchs (2014) concluded that compared to typically developing children, all children identified with learning disabilities showed significant working memory deficits.
 - Johnson et al (2010); in their meta analysis of cognitive processing deficits and learning disabilities, suggested that the key processes include working memory, processing speed, executive functioning, receptive and expressive language. Their review noted that Academic deficit is related to meaningful and empirically supported impairment in one or more specific psychological process.
 - Reading disorders, deficits in phonological processing, processing speed, and verbal working memory were implicated. Impairments in executive functioning, processing speed, and short term memory were linked to math disorders.
- Cavendish (2013) noted that the DSM-5 guidelines do not rule out the use of cognitive processing assessment, but they also do not provide guidelines for inclusion or interpretation.

Counter-arguments for the omission of cognitive processing in the definition include the following:

- Tannock’s (2013) review of the literature suggested that empirically, there is mixed support for the inclusion of processing deficits in a definition of learning disabilities.

- Stuebing et al (2012) and Miciak et al (2013) reported results negating the utility of cognitive processing models.
- Harrison & Holmes (2012) explained that in the combined model approach of Hale et al (2010), impairments in cognitive processes essential for academic achievement do not constitute a learning disorder on their own because many individuals without learning disabilities attain scores within an impaired range on tests of psychological processing. The authors go on to say that an impairment in a processing ability only becomes disabling when it interferes substantially with an individual's ability to carry out a regular or routine task that relies on the use of skills or knowledge in that area.

Harrison & Holmes (2012) recommend a three component model for LD assessment and diagnosis in Canada which they say is reflected in the LDAC and LDAO definitions. "Overall these Canadian definitions echo the themes endorsed by the three-component model and would therefore meet the requirements set out by experts in LD". (p.19)

The three component model includes: below average academic achievement relative to most other individuals; impairments in the cognitive processes responsible for normal development of the deficient academic abilities; and ruling out other reasonable causes for the academic deficits, including academic difficulties due to generally lower abilities required for reasoning and learning.

A comprehensive model, which links academic skill deficits and cognitive processing deficits, has been prepared by Price & Zwiers (2012) and is included in Appendix A.

Another Classification System: ICD

Many professionals working with individuals with LD are concerned that the DSM-5 model appears to be receiving considerable attention and causing disruption in practices. Some have cautioned that the DSM has not been "the gold standard" in education and therefore may not accept the DSM-5. It is noteworthy that the DSM is only one nosology or systematic classification of diseases developed by professional associations.

ICD Classification (WHO):

The World Health Organization is the directing and coordinating authority for health within the United Nations. It is responsible for providing leadership in global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.

The International Classification of Diseases (ICD) is developed by the WHO and is the world's most widely used standard tool to capture mortality and morbidity data. It also organizes and codes health information that is used for statistics and epidemiology, health care management, allocation of resources, monitoring and evaluation, research, primary care, prevention and treatment. It helps to provide a picture of the general health situation of countries and populations. Users

include physicians, nurses, other providers, researchers, health information managers and coders, health information technology workers, policy-makers, insurers and patient organizations. The 11th version is now being developed through an innovative, collaborative process and is due out by 2017. One proposal under active consideration for Learning Disorders includes criteria closely aligned with the LDAC Definition of Learning Disabilities including the perspective on cognitive processing.

The USA National Centre of Learning Disabilities

The USA National Centre on Learning Disabilities (NCLD) suggested the following.

... To better align the DSM-5 with current research and practice in learning disabilities, NCLD recommends the revisions in classification and the “Learning Disabilities” be used as an overarching category with subtypes including disorders of word reading (“dyslexia”); reading fluency; reading comprehension; written expression; mathematics calculation (“dyscalculia”); mathematics problem solving; along with “Learning Disabilities Not Otherwise Specified” be retained to capture difficulties that do not meet criterion for other areas but that constitute significant obstacles to learning, daily living and social-emotional well-being ... To enhance the effectiveness of the DSM-5, NCLD recommends revisions in language to include: ... “Difficulties in academic learning cannot be attributed to intellectual disability, sensory impairment, emotional disorder, or lack of educational opportunity. Multiple sources of data need to be used to assess academic skills, including but not limited to norm-referenced measures of academic achievement. Evaluation measures need to be culturally appropriate. “Contextualized assessment” (e.g., measures of progress over time, integrity and duration of instruction/intervention) should be considered as part of the determination of a disability or disorder ... It was the intention of the NCLD that the recommendations would enhance communication among practitioners throughout the helping professions and lead to greater precision in diagnostic and evaluation practices, resulting in more collaborative and efficient instructional and behavioral interventions for those who struggle with learning disabilities in school, in the community and in the workplace.

Conclusions and Recommendations

A critical factor in decision-making about whether to revise or not to revise the definition at this point in time is: What is in the best interest of the individuals with LD? Should there be a shift to criteria lacking conclusive evidence? What do other classification systems conclude?

There are many areas of agreement and consistency between the LDAC Definition of Learning Disabilities and the DSM-5 Diagnostic Criteria and Description for Specific Learning Disorder. However, there are critical variances including the specification of academic testing, intelligence testing, and cognitive processing.

With respect to the academic testing criteria being so specific in the DSM-5, individuals who have learning disabilities may not be eligible to be diagnosed as such because their performance does not fit the criteria. Young children may not receive early intervention because they do not meet the “absolute” levels.

There is also concern about how the adult with learning disabilities will be impacted by the DSM-5. Gifted individuals and post-secondary students with learning disabilities may no longer be eligible for supports if their academic achievement scores are not low enough at the “absolute” level defined by DSM-5. As noted previously, there is an emphasis on a “score” and not the qualitative pattern of skills important not only for diagnosis but also for interventions.

With respect to the intelligence testing issue, there is no direct statement in the DSM-5 to negate the continued use of intelligence testing. Rather, it is no longer necessary unless there is suspicion of intellectual impairment. This gives latitude to the professional carrying out the assessment. The main concern is how the intelligence test results are applied. The discrepancy model has been negated which is a positive step forward as it moves evaluation beyond a statistical method which was applied without regard for other significant criteria in diagnosing a learning disability. Therefore, there is basic agreement with the DSM-5 and LDAC Definition regarding intellectual impairment differentiated from Learning Disabilities or Specific Learning Disorder.

With respect to cognitive processing, there is a significant difference whereby DSM-5 clearly stipulates that cognitive processing is not part of the diagnosis, while the LDAC definition clearly stipulates that it is. However, there is some solid research to link cognitive processing and academic skills. Even though there is not yet sufficient research evidence to substantiate all of the cognitive processes linked to academic skills, there are discernible clusters of cognitive and neuropsychological processing strengths and weaknesses associated with academic skills and research evidence that has been identified. Some experts in the field agree with the DSM-5 position but others maintain that there is sufficient consensus and research to justify maintaining the position of cognitive processing patterns linked to academic achievement deficits in learning disabilities.

If both an intellectual profile and a cognitive processing profile are no longer included in the evaluation to determine diagnosis of learning disabilities, critical information is lacking in understanding the strengths and weaknesses as well as determining interventions and accommodations that best meet the needs of the individual. Ultimately, the goal is to help individuals with learning disabilities maximize their opportunities for success.

Given that there is much change and controversy in the field with regard to best practices in the diagnosis of learning disabilities, it is imperative that psychologists are aware of and understand the assumptions, strengths and limitations of the diagnostic framework that they choose to follow. There are merits and shortcomings in all of the approaches and psychologists must use their clinical judgment based on an awareness of the inferences being made and the best interests of the individual child or adult. In some settings, a formal learning disabilities diagnosis may not be required to receive services. In these situations, less emphasis is placed on the diagnosis (and its statistical parameters) and greater emphasis is placed on measures focused on the ability to perform reading, writing and math tasks in the classroom on a daily basis. In many provinces, the lack of a formal learning disability assessment for a student in elementary and/or secondary public school may not be necessary for the student to benefit from support and interventions. However, a formal assessment may continue to be required for students in postsecondary education and in the job market, to access services or accommodations.

It is important to consider that the lack of agreement amongst classification systems may undermine the credibility of the field among the public. The WHO is considering the diagnostic criteria of Learning Disorders and one proposal submitted is closely aligned with the current LDAC Definition of Learning Disabilities.

The authors of this Position Paper have attempted to present a balanced view in comparing the LDAC Definition of Learning Disabilities with the DSM-5. As indicated, there are similarities and areas of agreement but there are also significant differences for which specific pro and con arguments to highlight these differences have been summarized. However, in taking a global view of the comparisons of the LDAC definition versus the DSM-5, there is an important point that needs to be considered. An individual with a learning disability is more than someone who may show weaknesses on academic tests. There is so much more. An understanding of the various aspects of the “*whole*” person better positions parents, teachers and other professionals and indeed the individuals with learning disabilities themselves, to maximize the opportunities for success. Therefore, an assessment to identify and diagnose Learning Disabilities that includes some or all of the following provides a broader perspective: intellectual and cognitive processing abilities, executive functions, neuropsychological profile, learning styles and strategies, and social-emotional status in addition to academic basic skills. With more information about the individual, it is anticipated that interventions including teaching and learning strategies as well as accommodations can be recommended to best meet the needs of each individual learner.

The diagnosis or identification of Learning Disabilities goes beyond a process for a label or classification so that the individual has access to resources. The DSM-5 has taken a narrow view and placed significant emphasis on basic academic skills and the introduction of the DSM-5 criteria for diagnosing Learning Disabilities has resulted in much discussion and controversy, while the LDAC has long advocated that defining a Learning Disability goes well beyond results on academic tests of reading, written expression and mathematics. The LDAC has long understood that there are many aspects of Learning Disabilities and this is reflected in their definition while recognizing that there is still much to learn.

RECOMMENDATIONS

Given the above, there should be consideration for LDAC to:

1. Maintain the status quo and continue to support the current LDAC LD definition. It would be helpful to have the conclusion of other classification systems, notably the WHO deliberations.
2. Prepare a more comprehensive description of the issues associated with the Definition of Learning Disabilities similar to the description provided by the DSM-5 and the ICD so that there is an elaboration of the issues.
3. Carry out a literature review to have up to date, scientific research concerning the most divergent perspectives including:
 - Intellectual function and assessment
 - Cognitive processing deficits
 - Teaching practices and response to interventions
 - Academic Assessments
 - Educational environment

Such a database would provide readily accessible current research documentation concerning critical issues in the field of learning disabilities.

4. Proceed cautiously. Despite years of research and various attempts, there is still much unknown about the most effective teaching strategies for individuals with learning disabilities. Thus far, there is still much to learn about underlying brain functions and neuropsychological aspects of efficient learning and how individuals learn differently.
5. Take an open approach in the best interests of individuals with learning disabilities until conclusive evidence is found. If changes are to be made to the current definition, they should be made when there is much stronger conclusive evidence than is currently available to warrant change.

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- Dr. Maggie Mamen, Psychologist in a multi-, Ottawa, ON
- Dr. Linda Siegel, Professor Emeriti, Educational and Counseling Psychology and Special Education, University of British Columbia, Vancouver BC
- LDAC Volunteer Health Policy disciplinary private practice Advisor, Barbara McElgunn,
- LDA NB: Andre Deschesnes, Executive Director and his team of professionals in the field of LD
- LDA ON: Diane Wagner, Public Policy & Education Consultant,
- LDA QC: Lise Bibaud, Executive Director and her team of professionals in the field of LD
- LDA SK: Dale Rempel, Executive Director and Lynde Hill, Director of Psychological Services,

Appendix A: Linking Academic Skill Deficits and Cognitive Processing Deficits

Academic Skill Deficit	Core Cognitive Processes	Other Cognitive Processes
Reading		
Word recognition	Phonological awareness	Rapid naming Phonological Memory
Reading fluency	Rapid naming Processing speed Orthographic processing	
Reading Comprehension	Language <ul style="list-style-type: none"> • Vocabulary • Morphology • Syntax Listening comprehension Working memory Higher order processes <ul style="list-style-type: none"> • Inferencing • Prior knowledge • Comprehension monitoring • Story structure sensitivity 	
Mathematics		
Computation	Working memory Spatial processing Sequential processing Visual-spatial-motor integration	Attention Processing speed
Word problems	Working memory Executive Processes Language	
Written Expression		
Handwriting	Automaticity in retrieving and producing alphabet letters Orthographic coding Ability to form mental representations of written words Graphomotor planning for sequential finger movements	
Spelling	Phonological and orthographic coding (visual-motor integration) Vocabulary knowledge (grades 1-3)	
Composition	Handwriting automaticity Orthographic coding Working memory	

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Word Recognition:

Phonological awareness and Rapid Naming

Schatschneider, C., Fletcher, J.M., Francis, D.J., Carlson, C.D. & Foorman, B.R. (2004). Kindergarten prediction of reading skills: A longitudinal comparative analysis.

Reading Comprehension

Language – Vocabulary, Morphology, Syntax

Nation, K. Clarke, P., Marshall, C.M. & Durand, M. (2004). Hidden language impairments in children: Parallels between poor reading comprehension and specific language impairment? *Journal of Speech, Language and Hearing Research*, 47, 199-211.

Listening comprehension:

Shankweiler, D., Lundquist, E., Katz, L., Stuebing, K., Fletcher, J.M., Brady, S., et al. (1999). Comprehension and decoding: Patterns of association in children with reading difficulties. *Scientific Studies of Reading*, 3, 69-94.

Working memory

Stothard, S.E. & Hulme C. (1992). Reading comprehension difficulties in children: The role of language comprehension and working memory skills. *Reading and Writing*, 4, 245-256.

Nation, K., Adams, J.W., Bowyer-Crane, A., & Snowling, M.J. (1999). Working memory deficits in poor comprehenders reflect underlying language impairments. *Journal of Experimental Child Psychology*, 73, 139-158.

Cain, K., Oakhill, J.V., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability and component skills. *Journal of Educational Psychology*, 96, 31-42.

Higher order processes - Inferencing

Oakhill, J. (1993). Children's difficulties in reading comprehension. *Educational Psychology Review*, 5, 1-15

Prior knowledge

Cain, K., Oakhill, J.V., Barnes, M.A. & Bryant, P. (2001). Comprehension skill, inference-making ability and the relation to knowledge. *Memory and Cognition*, 29, 850-859.

Comprehension monitoring

Cataldo, M.G. & Cornoldi, C. (1998). Self-monitoring in poor and good reading comprehenders and their use of strategy. *British Journal of Developmental Psychology*, 16, 155-165.

Nation, K. (2005) Children's reading comprehension difficulties. In M.J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 248-266). Oxford, UK: Blackwell. (summarizes a variety of studies)

Story structure sensitivity

Perfetti, C.A., Landi, N., & Oakhill, J. (2005). The acquisition of reading comprehension skill. *The Science of reading: A handbook* (pp. 227-247). Oxford: UK: Blackwell.

MATHEMATICS – Computation - Working memory

Keeler, M.L. & Swanson, H.L. (2001). Does strategy knowledge influence working memory in children with mathematical disabilities? *Journal of Learning Disabilities*, 34, 418-434.

Wilson, K.M. & Swanson, H.L. (2001). Are mathematical disabilities due to a domain-general or domain-specific working memory. *Journal of Learning Disabilities*, 34, 237-248.

Word problems - Language

Jordan, N.C. & Hanich, L.B. (2000) Mathematical thinking in second-grade children with different forms of LD. *Journal of Learning Disabilities*, 33, 567-578.

Written expression - Handwriting

Automaticity in retrieving and producing alphabet letters, orthographic coding and speed of finger movements

Graham, S., Harris, K.R. & Fink, B. (2000). Is handwriting causally related to learning to write? Treatment of handwriting problems in beginning writers. *Journal of Educational Psychology*, 92, 620-633.

Spelling - Phonological and orthographic mappings and visual-motor skills

Berninger, V.W. (2004). Understanding the graphia in developmental dysgraphia: A developmental neuropsychological perspective for disorders in producing written language. In D. Dewey and D. Tupper (Eds.), *Developmental motor disorders: A neuropsychological perspective* (pp. 189-233). New York: Guilford Press.

Composition - Working memory

Berlinger, V.W. (2009). Highlights of programmatic, interdisciplinary research in writing. *Learning Disabilities Research and Practice*, 24, 69-80. (note – review of 25 years of research).

Executive functions

Berninger, V.W., Abbott, R. D., Jones, J., Wolf, B. Gould, I. Anderson-Youngstrom, M. et al. (2006). Early development of language by hand: Composing, reading, listening, and speaking connections; three letter-writing modes; and fast mapping in spelling. *Developmental Neuropsychology*, 29, 61-92.

Hooper, S.R., Swartz, C.W. Wakely, M.B. de Kruif, R.E.L., & Montgomery, J. W. (2002). Executive functions in elementary school children with and without problems in written expression. *Journal of Learning Disabilities*, 35, 57-68.

Appendix B: Official Definition of Learning Disabilities

*Adopted by the Learning Disabilities Association of Canada, January 30, 2002
Re-endorsed on March 2, 2015 by the LDAC Board of Directors*

Learning Disabilities refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency.

Learning disabilities result from impairments in one or more processes related to perceiving, thinking, remembering and/or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).

Learning disabilities range in severity and may interfere with the acquisition and use of one or more of the following:

- oral language (e.g. listening, speaking, understanding);
- reading (e.g. decoding, phonetic knowledge, word recognition, comprehension);
- written language (e.g. spelling and written expression); and
- mathematics (e.g. computation, problem solving).

Learning disabilities may also involve difficulties with organizational skills, social perception, social interaction and perspective taking.

Learning disabilities are lifelong. The way in which they are expressed may vary over an individual's lifetime, depending on the interaction between the demands of the environment and the individual's strengths and needs. Learning disabilities are suggested by unexpected academic under-achievement or achievement which is maintained only by unusually high levels of effort and support.

Learning disabilities are due to genetic and/or neurobiological factors or injury that alters brain functioning in a manner which affects one or more processes related to learning. These disorders are not due primarily to hearing and/or vision problems, socio-economic factors, cultural or linguistic differences, lack of motivation or ineffective teaching, although these factors may further complicate the challenges faced by individuals with learning disabilities. Learning disabilities may co-exist with various conditions including attentional, behavioural and emotional disorders, sensory impairments or other medical conditions.

For success, individuals with learning disabilities require early identification and timely specialized assessments and interventions involving home, school, community and workplace settings. The interventions need to be appropriate for each individual's learning disability subtype and, at a minimum, include the provision of:

- specific skill instruction;
- accommodations;
- compensatory strategies; and
- self-advocacy skills.

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