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LEARNING DISABILITIES

Definition of Learning Disability – RPWD Act

- “Specific Learning Disabilities” means a heterogenous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia.

IDEA – Individuals with Disabilities Education Act

- **Specific learning disability as “ 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.”**

DSM - V

According to DSM-5, the diagnosis of a specific learning disorder includes the following symptoms:

1. Persistent difficulties in reading, writing, arithmetic, or mathematical reasoning skills during formal years of schooling. Symptoms may include inaccurate or slow and effortful reading, poor written expression that lacks clarity, difficulties remembering number facts, or inaccurate mathematical reasoning.

2. Current academic skills must be well below the average range of scores in culturally and linguistically appropriate tests of reading, writing, or mathematics. Accordingly, a person who is dyslexic must read with great effort and not in the same manner as those who are typical readers.

3. Learning difficulties begin during the school-age years.
4. The individual's difficulties must not be better explained by developmental, neurological, sensory (vision or hearing), or motor disorders and must significantly interfere with academic achievement, occupational performance, or activities of daily living (APA, 2013).

https://www.youtube.com/watch?v=XjFJ_fu_J3A

<https://www.youtube.com/watch?v=A1I-RWaUxM4> – Learning Disabilities

Classification of Learning Disabilities

- Dyslexia
- Dysgraphia
- Dyscalculia

Dyspraxia,
Aphasia,
Language Processing Disorder,
Auditory processing disorders,
Non Verbal Learning Disability (NVLD)

Dyslexia

- <https://www.youtube.com/watch?v=UBImXpCHV-k> – Dyslexia

Affects reading and related language based processing skills.

Areas affected – Reading fluency, decoding, reading comprehension, recall, writing, spelling .

Otherwise called as Language Based Learning Disability.

Signs and Symptoms - Preschoolers

- Delayed speech, problems with pronunciation.
- Problems with rhyming words and learning rhymes.
- Difficulty with learning shapes, colors and how to write their own name.
- Difficulty with retelling a story in the right order of events.
- Lack of interest in playing games with language sounds (e.g., repetition, rhyming)
- Failure to recognize letters in their own name
- Trouble remembering names of letters, numbers, or days of the week

Signs and Symptoms – JUNIOR/Early GRADES

- Reading well below the expected level for age
- Problems remembering the sequences
- Difficulty in seeing similarities and differences in letters and words
- Difficulty in spelling words
- Receives reports of “not doing well in school”
- Unable to read one-syllable words, such as “mat” or “top”
- Problems in connecting sounds and letters (e.g., “big” for “got”)
- Difficulty in sequencing numbers and letters

Senior Grades

- When writing, frequently mistakes letters such as 'd' and 'b' or 'm' with 'w' .
- Writes words backwards the majority of the time, such as writing 'pit' when the word 'tip' was intended.
- Grammar issues, such as acquiring prefixes and suffixes.
- Avoids reading aloud in class and reading-related activities
- Requires lot of effort to reads single words and connected text
- Has trouble pronouncing multisyllable words
- Needs repeated reading to understand it on a regular basis

	Word-level	Sentence-level
Normal reader	reading	It is easy to read this sentence
Reader with dyslexia	reabing	If is easy to reab fhis senfence

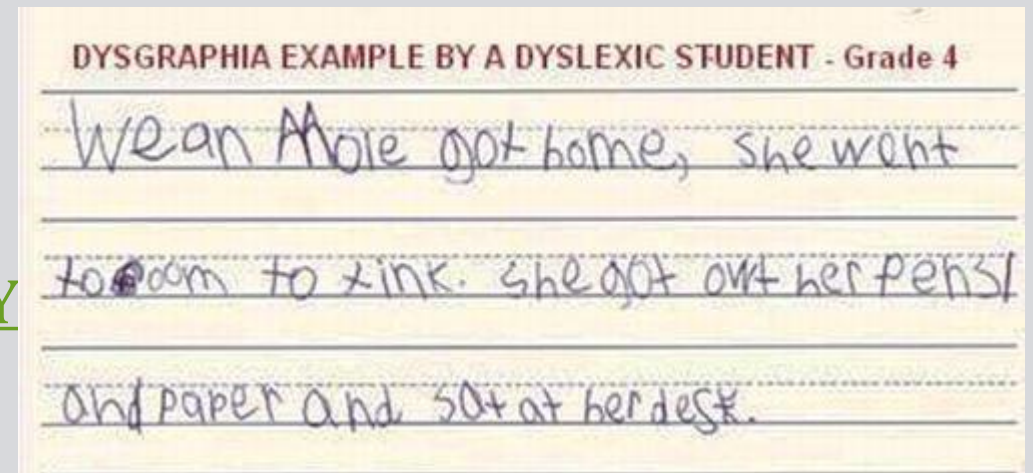
Assessment Tools

- The reading subtests useful are
 - Woodcock-Johnson Psycho-Educational Battery- Revised, and
 - The Peabody Individual Achievement Test-Revised
 - Test of Word Reading Efficiency (TOWRE)
- GLAD

DYSGRAPHIA

- Dysgraphia is a specific learning disability diagnosed in childhood that affects a person's handwriting ability and fine motor skills. It is characterized by poor writing skills that are significantly below for the child's age, intelligence, and education, and cause problems with the child's academic success or other important areas of life.

- <https://www.youtube.com/watch?v=XY>



Dysgraphia symptoms in children

- Avoiding written work
- Producing only a few words or sentences at a time when other pupils are completing many paragraphs
- Excessive difficulties in composing a text (output failure)
- Numerous technical faults of punctuation, grammar, word usage, sentence structure, and paragraph structure is observed
- Omitting words frequently in sentences or unfinished sentences

- Failure to capitalize the first letter of the first word in a sentence
- Poorly organized written work (e.g., weak paragraph organization; poor sentence cohesiveness)
- Illegible handwriting; incorrect use of upper- and lower-case letters, inverted characters; mixing of printing and cursive writing
- Basic written activities, such as taking notes, are challenging as they require simultaneous listening.
- Letters or sounds that are too similar are confused (e.g., “jumpt” for “jumped”; “caterpault” for “catapult”)
- Inability to choose the correct spelling from two reasonable options (e.g., successful/succesfull; conscious/ consious; necessary/necessery)
- Use of non-permissible letter strings consistently (e.g., “egszakt” for “exact”; discuss/diskus; “freeeqwnt” for “frequent”)
- Inconsistent page positioning in terms of lines and margins
- Uneven spacing between words and letters
- Cramped or odd grip; holds the writing instrument very near to the paper, or holds thumb over two fingers and writes from the wrist

Standardized tests for assessing written expression

- **Wechsler Individual Achievement test (WIAT-II).**
- **Test of Written Language (TOWL; 3rd edition).**
- **Test of Early Written Language (TEWL; 2nd edition).**
- **Test of Written Spelling (TOWS; 4th edition).**
- **Test of Written Expression (TOWE)**

DYSCALCULIA

- **It refers to a type of specific learning disability that affects a person's ability to understand numbers and learn math facts and difficulty in learning arithmetic.**
- <https://www.youtube.com/watch?v=IFoKyHxi3bM>

Symptoms of Dyscalculia

- Individuals might have difficulty reading clocks to tell time, counting money, identifying patterns, remembering math facts, and solving mental math.
- Counts with fingers because of difficulty with counting
- Problems with differentiating between left and right
- No alignment of digits and completing the arithmetic procedure in the wrong direction (e.g., left to right; top to bottom).
- Poor comprehension of fractional concepts ($1/2$)
- In older children (i.e., third grade and above), major impairments are evident in solving more complex arithmetic problems. And rapid retrieval of number facts (e.g., 4×9) and
- Difficulty keeping scores or remembering score procedures in games, like bowling, etc. Often loses track of whose turn it is during games, like cards and board games. Has limited strategic planning ability for games, like chess

Assessment Tools

- **Standardized tools to measure dyscalculia are,**
- **The Keymath Diagnostic Arithmetic Test assesses understanding of mathematical content, function, and calculation, among other things. It is used to assess students in grades one through six. Woodcock–Johnson Achievement Battery-III**
- **Test of Early Mathematical Abilities**
- **Teacher Academic Attainment Scale (TAAS)**
- **Child self- reported math anxiety scales. [11 items];**
- **Mathematics Anxiety Scale for Children**

Auditory processing disorder (APD)

- APD is a deficit in neural processing of auditory stimuli that is not due to higher order language, cognitive or hearing loss and yet it is associated with difficulties in learning disorder

Symptoms

The child may find it hard to,

- **Understand speech in the presence of competing background noise or in resonating acoustic environments**
- **Inability to localize the source of a signal**
- **Issues with hearing on the phone**
- **Inconsistent or inappropriate responses to requests for information**
- **Difficulty following rapid speech**
- **Frequent requests for repetition and/or rephrasing of information**
- **Unable to follow directions**
- **Difficulty or inability to detect the humor and sarcasm made by subtle changes in intonation.**
- **Difficulty learning a foreign language or novel speech materials, especially technical language**
- **Difficulty maintaining attention**

Language Processing Disorder

- **LPD is a type of Auditory Processing Disorder (APD) in which people have trouble putting meaning to the sound groups that make up words, phrases, and stories. While an APD affects how the brain interprets all sounds, a Language Processing Disorder (LPD) only impacts how language is processed [6]. This disorder arises when an individual has specific challenges in processing spoken language that impacts both receptive and expressive language.**

Expressive Language Skills	Receptive Language Skills
<ul style="list-style-type: none"> • Slow vocabulary growth 	<ul style="list-style-type: none"> • Trouble with processing sounds affects, with sequencing, linking thoughts, and concepts
<ul style="list-style-type: none"> • Pronunciation difficulties 	<ul style="list-style-type: none"> • Need extra time to process incoming information
<ul style="list-style-type: none"> • Difficulty in expressing (single words, poor/wrong retrieval of words, poor answering, narrative and conversational skills) 	<ul style="list-style-type: none"> • Do not understand jokes and laugh inappropriately or at the wrong times
<ul style="list-style-type: none"> • Grammatical difficulties. 	<ul style="list-style-type: none"> • Miss nonverbal language cue
<ul style="list-style-type: none"> • They have problems understanding complex sentence structures and responding to questions 	<ul style="list-style-type: none"> • Problems doing group work
<ul style="list-style-type: none"> • They will often use a less appropriate word because the right word will not come to them. 	<ul style="list-style-type: none"> • Have difficulties giving or following directions • Conversations will be marked by long silences

Non Verbal Learning Disabilities (NVLD)

- **Almost 65% of all communication is conveyed nonverbally.**
- **NLD is a disorder which is usually characterized by a significant discrepancy between higher verbal skills, weaker motor, visual-spatial and social skills.**
- **While it may sound like nonverbal learning disabilities (NVLD) relate to an individual's inability to speak, it actually refers to difficulties in decoding nonverbal behaviors or social cues.**
- **Children with NVLD are often well-spoken and can write well, but struggle with subtle social cues and comprehension of abstract concepts or the nonverbal aspects of communication**

Signs and Symptoms of NVLD

- **Trouble interpreting nonverbal cues like facial expressions or body language, tone of voice and poor coordination.**
- **Struggle with understanding of spatial relationships.**
- **Difficulty in developing fine-motor skills those results in poor handwriting, difficulty learning to tie their shoelaces, and problems using small tools and utensils.**
- **Are weak in executive functions or will find hard to sustain attention. They may have trouble handling new tasks, solving problems and remaining flexible in their thinking.**
- **They may also have difficulty staying focused, completing multi-step instructions, organizing tasks and materials and controlling their impulses.**
- **Exhibit difficulty with reading comprehension or mathematical problem solving**
- **Physically clumsy, often bumps into objects or people**

- <https://www.youtube.com/watch?v=9lZSPaR8ccw> – Dyspraxia
- <https://www.youtube.com/watch?v=nvaZXsSvF4I> - Aphasia

DIAGNOSTIC Criteria – ICD 11

- **Terminology for Learning Disability - Developmental Learning Disorder**
- **Code: 6A03**
- **Definition –**
- **Developmental learning disorder is characterized by significant and persistent difficulties in learning academic skills, which may include reading, writing, or arithmetic.**
- **The individual's performance in the affected academic skill(s) is markedly below what would be expected for chronological age and general level of intellectual functioning, and results in significant impairment in the individual's academic or occupational functioning.**
- **Developmental learning disorder first manifests when academic skills are taught during the early school years.**
- **Developmental learning disorder is not due to a disorder of intellectual development, sensory impairment (vision or hearing), neurological or motor disorder, lack of availability of education, lack of proficiency in the language of academic instruction, or psychosocial adversity.**

Sub- Types

- **6A03. 0 - Developmental learning disorder with impairment in reading**
- **6A03.1 - Developmental learning disorder with impairment in written expression**
- **6A03.2 - Developmental learning disorder with impairment in mathematics**
- **6A03.3 - Developmental learning disorder with other specified impairment of learning**
- **6A03.Z - Developmental learning disorder, unspecified**

Diagnostic Criteria – DSM – 5 - TR

A. Difficulties learning and using 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:

- 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 text 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).

B. 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.

C. 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).

D. 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.

F81.0 With impairment in reading:

Word reading accuracy,

Reading rate or fluency

Reading comprehension

F81.81 With impairment in written expression:

Spelling accuracy

Grammar and punctuation accuracy

Clarity or organization of written expression

F81.2 With impairment in mathematics:

Number sense

Memorization of arithmetic facts

Accurate or fluent calculation

Accurate math reasoning

SEVERITY LEVELS

- **Mild**
- **Moderate**
- **Severe**

PREVALENCE

The prevalence of specific learning disorder across the academic domains of reading, writing, and mathematics is 5%–15% among school-age children in Brazil, Northern Ireland, and the United States.

Reference

- <https://www.intechopen.com/chapters/79619>