
WHAT IS LEARNING DIFFICULTY (LD)?

Learning disabilities are due to **genetic** or **neurobiological factors** that affect **cognitive processes** related to **learning** such as reading, writing or math.

They can also interfere with higher level skills such as **organization, time planning, abstract reasoning, long or short term memory and attention.**

COMMON TYPE OF LEARNING DIFFICULTIES

Dyscalculia

– A learning disability demonstrates impaired **math calculation skills** and difficulty understanding **numbers and math facts.**

Dysgraphia

– A learning disability involves impaired ability to **produce legible and automatic letter writing** and often numeral writing.

Dyspraxia

– A learning disability impacts an individual's **muscle control.**

Dyslexia

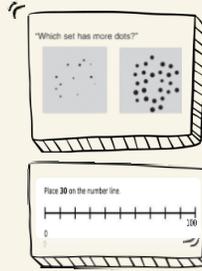
– A learning disability involves impaired skills with **word recognition, decoding, and spelling.**

COMMON TYPES OF LD DYSCALCULIA

A learning disability demonstrates impaired **math calculation** skills and difficulty understanding **numbers** and **math** facts.

Origin

Weaknesses in **number representation** and **processing**, which results in difficulties with **quantifying sets** **without counting**.



COMMON TYPES OF LD DYSGRAPHIA

A learning disability involves impaired ability to produce legible and automatic **letter writing** and often **numeral writing**, the latter of which may interfere with math.

Origin

Difficulty with storing and automatically retrieving letters and numerals caused by problems of **visual-spatial perception** or **fine motor coordination**.



COMMON TYPES OF LD DYSPRAXIA

A learning disability impacts an individual's **muscle control**, which causes problems with **movement and coordination, language and speech**.

Origin

Immaturity of **neural development** in the brain causing problems with **motor planning movement**.



COMMON TYPES OF LD DYSLEXIA

A learning disability involves impaired skills with **word recognition, decoding, and spelling.**

Origin

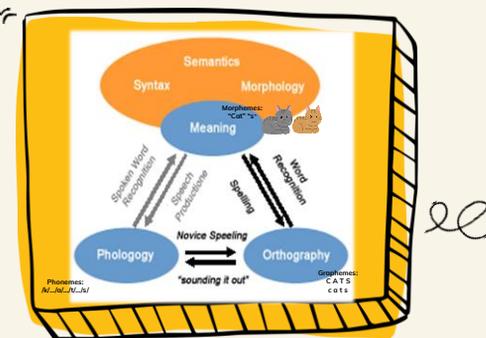
Deficits in **phonological, orthographical** and **morphological awareness**, which identify and manipulate the **sound, spelling and meaning** of word.



DYS-LEX-IA

- A word meaning "difficulty with language" or "difficulty with words", from the Greek morphemes "dys" and "lex"
- Synonymous with "specific reading disability"
- a problem learning to read that is unexpected in relation to experience, originating in neurobiological differences in the way the brain processes language

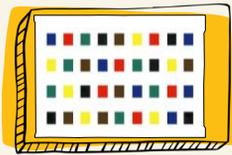
TRIANGLE MODEL OF READING



PHONOLOGICAL PROCESSING

- Phonological memory (encoding and storage of words, digits, and letters)
- Novel word repetition
- Speech production of single phonemes and phoneme sequences
- Phonological awareness
- E.g. Pet / Bet / Get / Let

RAPID AUTOMATIC NAMING (RAN)



- The ability to **quickly name** aloud a series of familiar items on a page. These include letters, numbers, colors or objects.
- Measure how fast an individual can **retrieve and produce** the sounds for the names of the items (phonological information).

ORTHOGRAPHIC SKILLS

ice	ike	ight
right	rice	bike
mice	night	Mike
like	dice	rice
price	right	slice
like	twice	right
lightly	like	slice
nicest	flights	strikes
dislike	priced	brighten
delighted	likeness	devices
sacrifice	childlike	conright

Independent contributions in **word recognition**

If orthographic imagery for single letters is unstable, the formation of automatic **orthographic-phonological connections** will be impeded

MORPHOLOGICAL AWARENESS

Morphemes	Example
Root words	Cat, Jump, Three
Prefixes	Un-, Re-, Mis-, Pro-
Suffixes	-ing, -ed, -ly, -ful
Boundroots	-ject, -rupt, -pute

Morphemes are the **minimal units of words** that **have a meaning** and cannot be subdivided further.

SYNTACTIC SKILLS

- **Syntax** is **the set of rules to construct a full sentences** using words or phrases.
- For example, the English sentences "The baby ate the carrot" and "The carrot ate the baby" do not mean the same thing, even though they contain the exact same words.
- Example of a English sentence structure:

Subject – Verb – Object (SVO)
"Tommy ate pancakes."

GRADES K-2

- Trouble segmenting and blending sounds
- **Poor letter-sound recall**
- Poor application of phonics
- Inconsistent memory for words & lists
- **Mispronouncing words**
- Inability to spell phonetically



GRADES 3-4

- **Phonic decoding** is a struggle
- Inconsistent **word recognition**
- Poor spelling
- Over-reliance on context and guessing
- Trouble learning new words (spoken)
- **Confusion about other symbols**



GRADES 5-6

- **Poor spelling**, poor punctuation
- **Organization of writing** is difficult
- Decodes laboriously, skips unknown words
- **Avoids reading**, vocabulary declines



GRADES 7-8

- **Slow reading**, loses the meaning
- Persistent phonological weaknesses, less obvious
- **Poor spelling and writing**
- **Confusions of similar words**
- Does better with structured, explicit teaching of language

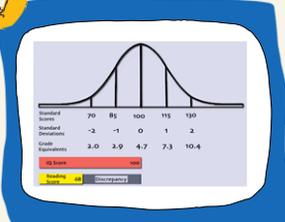


GRADES 9+

- Trouble with **foreign language** study
- **Writing and spelling** problems persist
- Reading is slow and labored, can't sustain
- **Longer writing assignments** very difficult
- Can cope when **given extra time, study strategies, and structured language teaching**



IQ-ACHIEVEMENT DISCREPANCY MODEL



Standard Deviation	70	85	100	115	130
Standard Deviation	-2	-1	0	1	2
Grade Equivalents	2.0	3.9	4.7	7.3	10.4

- There is a **significant difference** between a student's scores on a test of general **Intelligence** and scores obtained on an achievement test.
- The approach traditionally used to identify children with learning disabilities

Intervention Strategies for students with Reading Disability

1 Learning Profile

Ability the specific learning-related cognitive deficits



2 Chunking

Separating reading material into meaningful related groups of words to make **reading and understanding faster and easier** in order to improve comprehension.

Think about it as grabbing chunks of text, cut the page and making sense out of them as a group of words rather than stringing together a sentence. Then each individual word is recognized.

3 Multisensory Learning

Using **more than one sensory** to help **better learning**:

- Visual
- Auditory
- Touching
- Kinesthetic (Physical / Gestural)