



Specific Learning Disorder in Mathematics

Under new diagnostic criteria (DSM-V), Dyscalculia is now referred under the umbrella term of Specific Learning Disorder (SLD) with an impairment in Mathematics. Diagnosis of any SLD is followed by a description of the specific area(s) of impairment a child presents with, and is established through a clinical evaluation of the individual's developmental, medical, educational, and family history, analysis of test measures and clinical observations. Learning difficulties cannot be better accounted for by intellectual disabilities, trouble with visual or auditory acuity, other neurological disorders & psychosocial adversity among others. SLD with an impairment in Mathematics, sometimes referred to as 'number blindness' (Butterworth, 2003) is a neurological condition that hinders an individual's ability to understand, learn and execute number-based and mathematical concepts. Given effort and lots of practice, children with mathematical impairments may know what to do when solving a maths problem, however they continue to struggle in grasping the logic behind the steps they have to take in order to solve a problem. Dyscalculia affects various areas of math learning and performance and in turn creates different challenges for every child.

A prominent, and arguably defining, difficulty that these children face is with 'number sense'. This refers to an intuitive understanding of how numbers interact, of symbolic representation and how they compare and quantify on a number line – essentially harnessing a fluidity and flexibility with numbers. In order to be classified as SLD with an impairment in Mathematics, the various struggles faced must be evident during formal years of schooling, classified to be well below the expected age average, and must significantly impede on academic achievement, occupational performance and daily living. It is important to note that with SLD, there is a notable discrepancy between ability and aptitude – a child with dyscalculia would typically perform well in other school subjects such as English and Humanities, however fall short in math and math-related subjects.



An estimated 5 to 7% of elementary school-aged children may have SLD in Mathematics. It is also common for a child to present with more than one comorbid learning difficulty, an estimated 56% of children with a reading disorder also display poor math achievement and likewise 43% of children with math disability have poor reading outcomes (Thaker, 2013). Children with math difficulties have also been found to present with inattention, carelessness and other characteristics of Attention Deficit Hyperactivity Disorder (ADHD; Shalev et al., 2001).

Identifying Specific Learning Disorder with impairment in Mathematics

A young child with SLD in Mathematics may present with the following symptoms:

Difficulty recognizing numbers & delay in learning to count

Struggle with understanding number magnitudes

Finds it hard to recognize patterns and sort items by size, shape and color

Frustration intolerance which results in emotional outbursts

Consistently requires visual aids, like fingers, to help count

Difficulty connecting numerical symbols to their corresponding words

Struggle to remember directions, read clocks and tell time

Trouble telling left from right

Within the classroom, the following are likely to occur amongst children with math impairments:

Significant difficulty learning basic math functions such as addition, subtraction, multiplication, etc.

Struggles to grasp the underlying concepts within word problems & other non-numerical math calculations

Time management

Consistent difficulty with math homework assignments and tests

Struggles to process visual-spatial ideas, for example graphs and charts

The impact of having mathematics difficulties on social-emotional development and coordination

While math impairments are prominent and in turn focused upon how we conceptualize SLD in Mathematics, the disorder can also impact a child's social and emotional development. Having continuous struggles and perceived failures within the math classroom can make children vulnerable to feeling frustrated, de-motivated and self-conscious due to their difficulty to learn new math concepts and participate within other school activities that apply math and number concepts. Children with math difficulties may also avoid playing games and sports that involve keeping score. Due to associated visual-spatial processing difficulties, children with a SLD in Mathematics also often find it hard to orientate themselves, read maps and follow directions.



How can we help children with mathematics difficulties?

- In the classroom, children with mathematics difficulties are entitled to and would greatly benefit from accommodations to facilitate their learning. Accommodations that are predominantly recommended are as follows: extra time on class work and tests, minimizing background noise during work and having the option to verbally provide answers to class, and using supportive tools and tech, e.g. calculators and graph papers, to name a few.
- Strengthening what children learn in the classroom with a math tutor, especially one experienced in supporting children with learning disabilities, can encourage guided math learning in a more effective and interactive way. Tutoring also allows children to have extra math practice in a less stressful environment.
- Explaining to our children that the reason why they have difficulty solving math problems or remembering number facts is because of Specific Learning Disorder in Mathematics (Dyscalculia).
- Acknowledging their struggles and praising the effort that they put in to learn will empower and motivate them to push through – fostering their resiliency.
- To combat math-related anxiety, acknowledging their struggles and praising the effort that they put in to learn will empower and motivate them to push through frustrating situations – fostering their resiliency.

Bibliography

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Useful Links

www.childmind.org | www.understood.org | www.dyscalculia.org.uk
www.mathematicalbrain.com | www.bda-dyslexia.org.uk