This Month At

Vis-CAT

Official Newsletter of Visual Cognition Assessment tool

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Research Insights

Dear Vis-CAT Community,

When a child reads fluently yet struggles with maths, handwriting, or following visual instructions, their difficulties are often misunderstood or missed entirely. A landmark study published in JAMA Network Open (Margolis et al., 2020) and a later publication in the Journal of the American Academy of Child & Adolescent Psychiatry. (Fisher et al.,2025), has shone a light on this invisible learning barrier, known as Nonverbal Learning Disability (NVLD) and its findings underline just how many children are affected, but undiagnosed. The term NVLD is being proposed by experts to be redefined as Developmental Visual Spatial Attention Disorder (DVSD), recommending this be reflected in the new DSM (Diagnostic and Statistics Manual). The DSM contains the diagnostic criteria for every psychiatric/psychological disorder. It is the accepted gold standard for the diagnosis of mental disorders in the United States.

Data was analysed from three large North American studies the Healthy Brain Network, Nathan Kline Institute–Rockland Sample, and Saguenay Youth Study involving thousands of children and adolescents. They used a detailed, three-step process to identify NVLD based on:

1. Visual-spatial deficits (poor performance on visual-spatial reasoning tasks despite strong verbal skills)
2. Difficulties in related domains such as fine-motor coordination, mathematical reasoning, and social functioning
3. Exclusion of autism-spectrum traits, to distinguish NVLD from ASD

After adjusting for population weighting, the study estimated that 3–4 % of children roughly 2.2 to 2.9 million young people in the U.S. alone meet criteria for NVLD. Yet, most have never received a diagnosis. Many are mislabelled with ADHD or anxiety, or dismissed as “clumsy,” “distracted,” or “disorganised.”

The researchers concluded that greater awareness, earlier identification, and targeted interventions are urgently needed. “Given that few youths are diagnosed with NVLD and receive treatment, increased awareness, identification of underlying neurobiological mechanisms, and development and testing of interventions are needed.” Margolis et al., JAMA Network Open (2020)

NVLD highlights a crucial truth: not all learning barriers show up in reading or literacy tests. Children with NVLD typically perform well in word-based tasks but face major challenges in subjects and activities that rely on visual-spatial reasoning understanding patterns, geometry, maps, diagrams, hand-eye coordination, or social cues. This mismatch means they can slip through conventional school screening systems, with their difficulties emerging only after learning gaps or behavioural frustrations appear. By then, valuable early-intervention opportunities are lost.

At Area V1, we've built Vis-CAT® (Visual Cognition Assessment Tool) to address exactly this gap. Grounded in years of validated research into visual cognition using a Novel Dot Pattern Assessment Method (NDPA), Vis-CAT® translates complex cognitive testing into a fun, digital game that children can complete independently in classrooms, clinics, or research settings.

- Assesses visual cognition early before learning difficulties become entrenched
- Identifies hidden visual-spatial and processing deficits that may underlie academic or behavioural challenges
- Generates instant, easy-to-interpret reports for teachers and parents
- Supports educational equity by providing a fast, accessible, and scalable screening tool

The JAMA study estimated that millions of children struggle silently with NVLD-type profiles. Vis-CAT® is designed to find those children earlier making the invisible visible.

Most schools already screen for literacy, numeracy, hearing, and vision. But few assess visual cognition the brain's ability to interpret, organise, and respond to what the eyes see. That's where Vis-CAT® introduces a new dimension: by focusing on visual processing skills, it helps educators and clinicians uncover children who might appear capable on the surface yet are quietly battling with how they see and understand their visual world. This isn't just about detecting NVLD it's about broadening our understanding of how children learn and the diverse ways their brains process information.

The research findings make one thing clear: millions of children are struggling with undetected visual-spatial attention difficulties, limiting learning potential in 1 in 5 children. By embedding early, evidence-based screening tools like Vis-CAT® into education and health settings, we can change that story. Early detection leads to timely support, and timely support leads to thriving learners.

References:
- Margolis AE, Alexander LM, Horwitz T, et al. Estimated Prevalence of Nonverbal Learning Disability Among North American Children and Adolescents. JAMA Netw Open. 2020;3(3):e201271. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2764298
- Fisher, Prudence, Hillary D. Litwin, Mark A. Riddle, and Amy E. Margolis. Report of a Work Group on Nonverbal Learning Disability: Consensus Criteria for Developmental Visual-Spatial Disorder: Reconceptualizing Nonverbal Learning Disability for DSM Consideration. Journal of the American Academy of Child & Adolescent Psychiatry 64 no. 8 (2025): 882-896. https://www.jaacap.org/article/S0890-8567(25)00014-0/fulltextThe Vis-CAT Team