

NICHD Learning Disabilities Research Information

En Español 

The NICHD is one of several federal agencies that support and conduct research on learning disabilities and disorders. The institute's research portfolio includes studies investigating the causes, development, neurobiology, prevention, and remediation of learning disabilities. In addition, the NICHD provides funding to train researchers in this field.

NICHD Research Goals

NICHD aims to prevent learning disabilities when possible and to intervene early when learning difficulties or disabilities and associated conditions occur through two programs: the [Reading, Writing, and Related Learning Disabilities Program \(/about/org/der/branches/cdbb/programs#reading\)](/about/org/der/branches/cdbb/programs#reading) and the [Mathematics and Science Cognition, Reasoning, and Learning: Development and Disorders Program \(/about/org/der/branches/cdbb/programs#mathematics\)](/about/org/der/branches/cdbb/programs#mathematics).

NICHD research goals related to learning disabilities include:

- Understanding the role of the individual's environment, their genes, their brain, their behavior, and their thinking and memory processes
- Investigating the genetic and neurobiological foundations of these disabilities
- Creating measurement tools to identify children at risk
- Developing and evaluating prevention methods
- Developing and assessing remediation and instructional approaches that promote learning

Research Activities and Advances

Learning disabilities can take a toll on children and their families. NICHD supports research to address reading, writing, math, and related disabilities and disorders.

Institute Activities and Advances

NICHD has a history of supporting research on learning disabilities and related conditions. The [Child Development and Behavior Branch \(CDBB\) \(/about/org/der/branches/cdbb\)](/about/org/der/branches/cdbb) supports much of the research in this area through the [Reading, Writing, and Related Learning Disabilities \(RWRLD\) Program \(/about/org/der/branches/cdbb/programs#reading\)](/about/org/der/branches/cdbb/programs#reading) and the [Mathematics and Science Cognition, Reasoning, and Learning: Development and Disorders \(MSCRL\) Program \(/about/org/der/branches/cdbb/programs#mathematics\)](/about/org/der/branches/cdbb/programs#mathematics).

The RWRLD program focuses on research and training to understand how reading and writing skills develop during a person's life. One goal is to develop ways to prevent these disabilities. Another goal is to develop better teaching methods for reading and writing skills. The program includes studies to integrate what we learn about the genetic, neurobiological, and cognitive/behavioral causes. It includes studies on ways to help children with reading and writing disabilities. The program also includes studies to develop measurement tools to support these efforts. RWRLD's efforts are complemented by other CDBB programs. These include the [Early Learning and School Readiness Program \(/about/org/der/branches/cdbb/programs#early-learning\)](/about/org/der/branches/cdbb/programs#early-learning); the [Language, Bilingualism, and Biliteracy Program \(/about/org/der/branches/cdbb/programs#language\)](/about/org/der/branches/cdbb/programs#language); and the [Behavioral Pediatrics and Health Promotion Research Program \(/about/org/der/branches/cdbb/programs#behavioral\)](/about/org/der/branches/cdbb/programs#behavioral).

MSCRL focuses on research on mathematical thinking and problem solving. The program funds research on scientific reasoning, learning, and discovery from infancy to early adulthood. It explores factors that may contribute to atypical development in mathematics and science learning and thinking. These influences include genetic and neurobiological factors. They also include cognitive, language, sociocultural, and instructional factors. This research also:

- Investigates individual differences that affect achievement in math and science
- Delineates the skills needed to improve in these areas
- Develops ways to address learning difficulties that frequently emerge in math and science
- Develops instructional methods to reduce these learning difficulties

In 1997, NICHD and the U.S. Department of Education created the [National Reading Panel \(/research/supported/nrp\)](/research/supported/nrp) to draw on scientific evidence to identify the best ways to teach children to read. The [Panel's report \(/publications/product/64?pubs_id=89\)](/publications/product/64?pubs_id=89), which included research supported by the RWRLD program, noted that children who received explicit instruction in specific components of reading were more successful readers than those who did not receive such instruction. The Panel's findings have since contributed to nationwide standards in education.

NICHD-sponsored research also influenced the 2004 revision of the IDEA legislation. The research demonstrated the limitations of identifying reading disabilities based solely on discrepancies between a child's IQ and achievement. This is called the discrepancy model. Now, states can consider alternative approaches to identifying learning disabilities, and educators can provide early intervention.

In a related study, NICHD-sponsored researchers used brain imaging technology to compare the brain functioning of poor readers with low IQ scores and poor readers with typical IQ scores. They found no reliable functional brain differences between the two groups, thereby strengthening the evidence against the discrepancy model.

Improvements in brain imaging technology have helped researchers understand learning disabilities much better. For example, NICHD-supported researchers used brain imaging to show that the functional brain patterns of poor readers change with successful reading remediation to more closely resemble that of skilled readers.

Researchers also are looking at how genes interact with each other and with the environment to increase the risk for learning disabilities. The goal is to better understand what causes or affects learning disabilities and create interventions. For example, NICHD-supported researchers found a dyslexia-susceptibility gene and helped find how it links to reading ability. Using long-term studies of twins, another NICHD-supported study showed that genes' effects on reading performance are also affected by a child's environment.

NICHD-funded researchers are also working to understand dyscalculia. One study found that people with dyscalculia may have difficulty understanding that any number or quantity can be broken into smaller numbers. The study also found that children considered low achievers who do not have dyscalculia struggle less with math than children with the disorder. In part, this is because children without dyscalculia are better able to memorize new math facts. Another study found that having a less sensitive ability to estimate and compare quantities without counting may underlie dyscalculia. In children without dyscalculia but with low math achievement scores, this ability appeared similar to that of their typically achieving peers. This suggests that children with dyscalculia have different deficits and need interventions designed to target these unique challenges.

Other Activities and Advances

NICHD continues to create, collaborate in, and support activities to advance the field. These efforts include the following:

Staff at the CDBB collaborated with the former National Institute for Literacy (NIFL) to develop and revise a number of NIFL publications, including [Put Reading First: The Research Building Blocks for Teaching Children to Read \(/publications/product/239?pubs_id=226\)](/publications/product/239?pubs_id=226), a resource on evidence-based instruction for teachers, as well as [reading publications for parents and families \(/publications/list/collection?g=7&col=18&cat=all\)](/publications/list/collection?g=7&col=18&cat=all).

NICHD's [Learning Disabilities Research Centers Consortium \(/research/supported/pages/ldrc.aspx\)](/research/supported/pages/ldrc.aspx) investigates the causes, origins, and

development of learning disabilities. The consortium is identifying the genetic, brain-related, and treatment characteristics of children, adolescents, and adults with learning disabilities.

NICHD supported the [National Early Literacy Panel \(NELP\)](http://lincs.ed.gov/earlychildhood/NELP/NELP09.html).

(<http://lincs.ed.gov/earlychildhood/NELP/NELP09.html>), which convened in 2002 to review research on the development of early literacy skills in children ages 0 to 5. The aim was to identify the early skills that are important to literacy, to identify the teaching methods that teachers and parents could use to support those early skills, and to contribute to the educational policies that will enhance literacy. This effort resulted in the [Developing Early Literacy: Executive Summary of the NELP](/publications/product/345?pubs_id=5749) (/publications/product/345?pubs_id=5749) and the [Developing Early Literacy: Report of the NELP](/publications/pages/pubs_details.aspx?pubs_id=5750) (/publications/pages/pubs_details.aspx?pubs_id=5750) publications. [Developing Literacy in Second-Language Learners](https://www.cal.org/resource-center/publications-products/developing-literacy) (<https://www.cal.org/resource-center/publications-products/developing-literacy>), the report of the National Literacy Panel on Children and Youth, was partially funded by NICHD along with the U.S. Department of Education. This report includes research supported by NICHD on bilingualism, second-language learning, and cross-linguistic studies of reading.

PubMed Search Results

Use the links below to search the PubMed database for scientific articles.

- [PubMed search results for articles with keyword “learning disabilities” that were supported or conducted by NICHD](https://www.ncbi.nlm.nih.gov/pubmed/?term=learning%20disabilities%20nichd) (<https://www.ncbi.nlm.nih.gov/pubmed/?term=learning%20disabilities%20nichd>).
- [PubMed search results for all articles with keyword “learning disabilities”](https://www.ncbi.nlm.nih.gov/pubmed/?term=learning%20disabilities) (<https://www.ncbi.nlm.nih.gov/pubmed/?term=learning%20disabilities>).

Related A-Z Topics

[Reading and Reading Disorders](/health/topics/reading) (</health/topics/reading>).

[Early Learning](/health/topics/early-learning) (</health/topics/early-learning>).

[Neuroscience](/health/topics/neuro) (</health/topics/neuro>).

NICHD News and Features

[Director's Corner: Celebrating 30 Years of Medical Rehabilitation Research \(/newsroom/news/110520-NCMRR\)](#)

[Item of Interest: NICHD Selects Six Infrastructure Centers to Promote Rehabilitation Research \(/newsroom/news/071420-rehabilitation-research\)](#)

[Item of Interest: James A. Griffin, Ph.D., named new Chief of NICHD's Child Development and Behavior Branch \(/newsroom/news/040120-griffin\)](#)

[All related news \(/newsroom/news?topic=learning\)](#)