

# Vision may be the real cause of children's motor skill and developmental delays

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Are you a little clumsy sometimes? Do you or does your child struggle to read, write or do math? Maybe vision is the real root of the problem. Credit: Colourbox

Do you have poor motor skills or struggle to read, write or solve math problems? Maybe it's really because of how your brain interprets what it sees.

Visual processing is about how the brain perceives and processes the impressions of the eyes. Problems with processing visual impressions can also impact a variety of other skills.

"We've confirmed that visual processing may apply to dyslexia, but also to why some children have problems with mathematics and motor skills," says Professor Hermundur Sigmundsson at NTNU's Department of Psychology.

In addition, problems with visual processing may explain why some dyslexics respond more slowly when driving a car, at least as has shown to be the case in a driving simulator.

## Clear connection

A research group from NTNU compared two groups, described in a new article in the prestigious Scandinavian Journal of Educational Research.

One group consisted of the top ten percent of performers on a test that is often used to determine whether an individual has dyslexia, and the other group consisted of the ten percent who struggled the most on the test.

In total, the researchers surveyed almost 200 people. They used two different computer programs to test the participants. One program checked how efficient the brain is at detecting movement or rapid changes in the surroundings, while the control task was to find a figure hidden in a pattern.

"We found a clear difference between the two groups with high or low literacy in their ability to perceive movement," says Sigmundsson.

This strengthens previous findings that have pointed in the same direction. The researchers found no difference between the groups in their ability to solve the control task with figures that included shape and colour.

Researchers at NTNU have previously linked dyscalculia, which is when a person has problems solving mathematical problems, to visual processing. The same connection applies to motor difficulties in children.

## New app makes vision easier to investigate

Visual processing may well be an innate ability that be exercised much, if at all. This can put certain limitations on how good you become at certain things, and you can only compensate with other skills and exercises to a certain point.

But a new app can at least make it easier to investigate the issue. It can help to determine if someone is struggling with [visual processing](#) associated with rapid changes in their surroundings.

In the work related to the most recent article, the

research team used the app Magno. NTNU researchers designed the app for Android. Professor John Krogstie, who heads the Department of Computer Science (IDI) was also involved in the study.

### **Interdisciplinary**

"At IDI we've had several tasks related to this problem, both in being able to conduct the test itself and how to manage the test results if a lot of people are to take such a [test](#)," says Krogstie.

In addition to the computer technology challenges of creating such systems per se, the scope here is related to general solutions that contribute to learning using IT solutions, Krogstie says.

"By knowing more about the specific challenges a learner has, we can create customized solutions that take the challenges into account," says Krogstie.

The work is linked to broader activity within the Learner Computer Interaction workshop at the department.

"This is an interdisciplinary activity that requires collaboration across academic fields. Having a good working relationship with others, including those in the field of the psychology of learning, is a natural thing. The collaboration around Magno contributes to stronger cooperation across academic subject areas. This is useful in numerous contexts," says Krogstie.

**More information:** Kaja Egset et al. Magno App: Exploring Visual Processing in Adults with High and Low Reading Competence, *Scandinavian Journal of Educational Research* (2020). [DOI: 10.1080/00313831.2019.1705903](https://doi.org/10.1080/00313831.2019.1705903)

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