

# Pre-school age exercises can prevent dyslexia

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A typical characteristics of children's linguistic development are early signs of the risk of developing reading and writing disabilities, or dyslexia. New research points to preventive exercises as an effective means to tackle the challenges children face when learning to read. The results achieved at the Centre of Excellence in Learning and Motivation Research were presented at the Academy of Finland's science breakfast on 21 August.

Headed by Professor Heikki Lyytinen at the University of Jyväskylä, the research has dug deep into how to predict and prevent difficulties in learning to read and write. The study involved a comparison between 107 children whose either parent is dyslexic and a control group of children without a hereditary predisposition to dyslexia. The researchers followed intensively the development of the predisposed children, from their birth through to school age.

"Half of the children whose parents had difficulties in reading and writing found learning to read more challenging than children in the control group. The atypical characteristics of these children's linguistic development indicated the risk at a very early stage, and we were also able to draw a clearer picture of the typical progression of a development that indicates reading and writing difficulties," says Lyytinen.

According to Lyytinen, the predictors of reading and writing difficulties are evident primarily in two contexts: on the one hand as a delayed ability to perceive and mentally process the subtleties of speech sound,

on the other hand as a sluggishness in naming familiar, visually presented objects. When approaching the age when they acquire the ability to read, the children seem to have more difficulties than expected to store in their memory the names and corresponding sounds of letters.

"Acquiring the ability to read demands much more practice from these children than from their peers. The automatising of reading poses an additional challenge. Also, a fluent ability to read is a prerequisite to be able to understand a demanding piece of text," says Lyytinen. "A slow reader isn't able to grasp a given text as a whole, and therefore has a hard time following the storyline. This is why we should pay special attention not only to the accuracy of reading and writing but also to the comprehension of texts even with quite long sentences."

## **Computer game to aid learning**

The difficulties children experience when learning to read can be significantly reduced through training – "and in a way that children find amusing, even if they do have difficulties in learning to read," Lyytinen points out.

The CoE in Learning and Motivation Research has developed computer game-like learning environments to aid preventive training, and made them available on the internet free of charge. They are especially recommended for children with a perceived risk of developing reading and writing disabilities or who have had a hard time learning to read already in first grade.

"The best time to start these exercises is the latter part of the pre-school age, but it's not too late even after the children have started school. The learning result, of course, improves with repeated training: more than once a day and in short sessions. The optimal time for a single playing session is however long the children find it enjoyable."

Researchers at the CoE in Learning and Motivation Research have made good use of a wide range of scientific disciplines in creating the learning environment. Apart from psychology, the exercises include elements from phonetics, mathematics and information technology. This has allowed the researchers to make the learning environment more effective than traditional educational games.

Source: Academy of Finland

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