

# Study: Children need self-regulation to learn

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Credit: UiS/Mari Løvås

A considerable amount of development takes place in the brains of young children. Children experience a steep increase in their cognitive skills—including self-regulation—at an early age. What exactly is self-regulation? And why is it so important—especially for children?

"Self-regulation is important because we use it for concentrating and solving [complex problems](#), as well as for planning and undertaking tasks," says doctoral research fellow Dieuwer ten Braak at the Norwegian Centre for Learning Environment at the University of Stavanger

It is also important for the development of our social skills and when playing and interacting with other children, as well as for developing [academic skills](#) such as learning to read, write and solve mathematical problems.

Together with Norwegian and American colleagues, Dieuwer ten Braak investigated the connection between [self-regulation](#) and early literacy, language and mathematical skills when children go from kindergarten to first grade in Norway. Their findings have recently been published in *Journal of Applied Developmental Psychology*.

"Self-regulation is a concept that is often misunderstood. It is therefore important that parents and kindergarten employees have access to the correct knowledge about this subject, why it is important for children to develop this ability, and how such development can be encouraged," says the doctoral research fellow.

## **Ability to regulate own behavior**

Dieuwer ten Braak says that although there are many different definitions of the concept of self-regulation, there is general agreement that it includes the ability to regulate one's own thoughts and behavior by inhibiting or controlling impulsive responses, remembering information and processing it, as well as having the ability to maintain and change focus.

"For example, a child with good self-regulation abilities will be able to

remember and process complex information more easily. She says that a message such as: "Good morning Alex, how are you? Did you have a nice weekend? Don't forget to take your boots off before you go in! We're going to eat breakfast right now," requires the child to remember and process a lot of information.

"Furthermore, the child needs to control the impulse to run straight in. Children need self-regulation in order to maneuver in a complex world and take advantage of the learning opportunities around them."

## **Children's surroundings are important**

Many studies that show a connection between self-regulation and academic skills have been conducted in the U.S..

Dieuwer ten Braak explains that while kindergarten in the U.S. is based on a tradition that aims to prepare children for school with structured learning activities designed to encourage academic skills, kindergarten in Norway is based on a different tradition that promotes learning through [free play](#). It is important to take this difference into account when interpreting results from the U.S..

"We know that self-regulation and academic skills do not develop in a vacuum, but that they are affected by the environment in which children grow up. Obviously kindergartens are important because children spend a lot of time there each day. Consequently, we cannot simply generalize the results of American studies to Norwegian children," she says.

This is one of the first Norwegian studies that looks at self-regulation and specifically at how it relates to early literacy, language, and [math skills](#) when children make the transition from kindergarten to first grade.

A total of 243 children from 19 different kindergartens took part in the

study.

## **Connection between self-regulation and mathematical skills**

Self-regulation is important when learning new skills and acquiring new knowledge—especially when a task is difficult. Once we have automated a skill, we no longer need to employ so much self-regulation.

"Just imagine the time when having to learn how to drive a car. That required a lot of self-regulation. You had to control your impulse to look at the cars passing by, at the same time you had to process complex information about the traffic and roads around you and shift your attention from the traffic to operating the car. After you have driven a car for many years, this almost happens automatically," says Dieuwert Braak.

The study undertaken at the Centre for Learning Environment at the University of Stavanger shows that there is a strong connection between self-regulation and mathematical skills in children and that this association goes in both directions.

"In other words, children's self-regulation in kindergarten is not just relevant for how they succeed in mathematics in first grade. Their kindergarten math skills seem also relevant for their self-regulation abilities in first grade."

"This is also apparent in studies undertaken in other countries," she says, and explains that this suggests that play-based math activities in kindergarten can be one way of helping children to develop self-regulation in a meaningful way.

## **Increasing complexity**

The researchers found no such connection between self-regulation and early reading skills. They were unable to say anything definite about why there is a particularly strong connection between self-regulation and mathematics.

In further research, Dieuwert ten Braak and her colleagues will investigate what could explain the fact that there is such a strong connection between self-regulation and mathematics.

"One possible explanation could be that while early literacy—i.e. rhyming, recognizing sounds in words, and learning letters—is about automation and the ability to achieve flow when reading—mathematics becomes increasingly more complex and will therefore require continuous use of self-regulation skills, such as working memory," says Dieuwert ten Braak.

This does not mean that this ability is not important for learning to read, but it may be important only for a very short period of time and therefore not captured in the study. It may be that the connection becomes stronger when reading skills become more advanced, e.g., when children have to learn to comprehend more complex texts at school.

"The study also shows that children's vocabulary is predict for their self-regulation in first grade, but not the reverse. In other words, the promotion of language in kindergarten could be an important tool for enabling children to develop their self-regulation. The theory here is that children learn to regulate their own behavior by using their inner voice—and for that they need language," says Dieuwert ten Braak.

## **Role of kindergartens**

Children's home environment can strengthen their ability to regulate their own behavior, but if they experience a lack of structure, a chaotic or stressful home situation, this could hinder the development of self-regulation.

"All children have the potential to develop this ability," she says and adds that [kindergarten](#) can play a role by giving [children](#) the opportunity to develop the self-regulation that some of them do not acquire at home.

**More information:** Dieuwer ten Braak et al. Bidirectionality in self-regulation and academic skills in play-based early childhood education, *Journal of Applied Developmental Psychology* (2019). [DOI: 10.1016/j.appdev.2019.101064](#)

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