

# Good motor control boosts learning

11 October 2016, by Elin Bäckström

Infants with good motor skills are better at solving problems that require good cognitive skills. These are the findings of a new study from Uppsala University's Child and Baby Lab recently published online in the scientific journal *Psychological Science*. The study findings could be an argument for a greater focus on sports in primary and secondary school and active play in preschool.

In her study, researcher Janna Gottwald studied 70 eighteen-month-old [children](#). This is the first study conducted on infants that explores the connection between motor planning and cognitive planning and looks at executive functions in early [child](#) development.

The study contained a [motor control](#) component that tested speed and deduction skills, and an executive component where the child was given three different cognitive problems to solve.

The motor control component measured the speed at which the children performed one difficult and one easy task. Their movements were recorded using a motion tracking system. The children were to take a toy and put it into a box. The easy (big) box was placed nearby and it was easy to put the toy in the box. The difficult (small) box was further away and the child had to work a little to get the toy into the box.

"We noticed that some children were quicker to reach for a toy and had an easier time getting it into the right box, and that other children were slower. Even when we increased the difficulty level of the tasks, those children were able to get the toy and put it in the right box. We could see that they were able to calculate how easy or difficult the task was and that they planned their effort based on this knowledge," says Janna Gottwald, Department of Psychology, Uppsala University.

The executive functions component contained three different parts.

In the first, the researcher put an attractive, sparkly

toy near the child and said that they were not allowed to touch it. The idea was to see how long the child could wait before taking the toy. The maximum time was set at 30 seconds, but the average time the child waited was 7 seconds.

The second part studied working memory. In a small dresser with four drawers, a toy was placed in one of the drawers. The study measured how quickly the child could find the toy.

In part three, the child was supposed to take a toy out of a drawer with a transparent lid. To open the lid, the child needed to press a button. Most of the children wanted to pick up the toy through the transparent lid, however, and did not make the connection that the button opened the lid for them.

The researcher found a link between how the children performed the motor control element and the cognitive elements.

"The children who were quick and successful in the motor control element were better at the tasks that required working memory than the children who were slower. They were also better at stopping themselves from reaching for the sparkly toy. These findings indicate a link between children's motor skills and their cognitive development. 'The body might shape their mind' – this is a strong argument for the importance of physical activity, for focusing on sports and active play in preschool," says Janna Gottwald.

When this link is known, it could help staff at paediatric health centres and preschools find new ways to help children with motor control issues. With early training, they might be able to avoid learning problems later in life.

"If we can see early on that a child's [motor skills](#) are not developing as expected, it could be a sign that the child needs help with cognitive development later in life. This gives us the chance to prevent problems and plan for special educational interventions early in school and preschool," says

Janna Gottwald.

The Child and Baby Lab at Uppsala University conducts research and investigates the motor, social, psychological and [cognitive development](#) of infants and children, often using technical equipment like eye tracking, EEG and motion capture, which help them gain insight into the processes that enable children to understand and interpret their surroundings.

**More information:** J. M. Gottwald et al. An Embodied Account of Early Executive-Function Development: Prospective Motor Control in Infancy Is Related to Inhibition and Working Memory, *Psychological Science* (2016). [DOI: 10.1177/0956797616667447](#)

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