Starting school boosts development

Positive effects on children’s ability to concentrate and control their behavior

Berlin, May 2017 – A longitudinal study carried out at the Max Planck Institute for Human Development sheds light on the effects of school entrance on the brain development of children. The findings are published in Psychological Science.

Sitting still, following lessons, resisting distractions by fellow pupils and other enticements – starting school is a challenge for first-year pupils, who have often come from play-oriented kindergarten. However, the structured learning environment of school appears to affect children’s brains rapidly. Within the first year of school, the ability to concentrate and to control behavior is already better than that of kindergarten children of similar ages. This is the result of a study carried out by researchers at the Max Planck Institute for Human Development and the University of California, Berkeley. „Between five and seven years of age, children make great leaps and bounds in development, particularly in the ability to control their own behavior. We were interested in finding out whether this is only related to general maturation of the brain or also to school entrance, which often occurs in this phase of life,“ says lead author Garvin Brod, formerly at the Max Planck Institute for Human Development, now at the German Institute for International Educational Research (DIPF). The study is part of the “HippoKID” project at the Max Planck Institute for Human Development, and the first neuroscientific longitudinal study examining the effects of school entrance on brain development.

The study’s findings are based on data of 60 children who all were five years old when assessed for the first time. In order to assess changes resulting from school entrance, the tests were repeated after one year. Whereas all of the children were still going to kindergarten at first testing, some of the children were already attending school by the second testing session. On both occasions, the children worked on computerized tests assessing their ability to sustain attention and control their behavior. In addition, the children’s brain activity while performing one such test was measured using magnetic resonance imaging (MRI), a brain imaging technique that is safe for use in children.

Both groups – the kindergarten children and the schoolchildren – improved their attention and the ability to control their behavior. However, the schoolchildren showed a bigger improvement than the kindergarteners. Additionally, they showed a bigger increase in activation of a brain region that is known to be important for sustained attention: right parietal cortex. Moreover, children with a greater increase in parietal activation showed a bigger improvement in control performance. „Our results indicate that the structured learning environment of school has a positive effect on the development of behavioral control,“ states Garvin Brod.
The researchers caution against over-interpreting their findings: "This does not mean that early school entrance is necessarily better for children. We can not answer the question about the right time to start school – this has to remain an individual decision. Each child is different. And we don't yet know whether the effects are lasting," says co-author Yee Lee Shing, principal investigator of the HippoKID Study at the Max Planck Institute for Human Development and now lecturer at the University of Stirling. "But these results demonstrate, for the first time, how environmental context shapes the brain in five-year-olds transitioning into school," adds co-author Silvia Bunge, who works as a Professor at the University of California, Berkeley.

Background information

Original article

About the study
The study was funded through a Max Planck Minerva Research Group led by Yee Lee Shing. The overarching goal of this group was to better understand the mechanisms through which environmental factors, such as school entry and stress-related social disadvantage, may affect neural and behavioral development. The HippoKID Study longitudinally followed children born close to the cut-off date for school entry who subsequently did or did not enter school that year.

Max Planck Institute for Human Development
The Max Planck Institute for Human Development in Berlin was founded in 1963. It is an interdisciplinary research institution dedicated to the study of human development and education. The Institute belongs to the Max Planck Society for the Advancement of Science, one of the leading organizations for basic research in Europe.