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Press Release

Tübingen Study: Sleep Reinforces Learning

During sleep, our brains store what we have learned during the day – a process even more effective in children than in adults

Tübingen, 25.02.2013

It is important for children to get enough sleep. Children's brains transform subconsciously learned material into active knowledge while they sleep – even more effectively than adult brains do, according to a study by Dr. Ines Wilhelm of the University of Tübingen's Institute for Medical Psychology and Behavioral Neurobiology. Dr Wilhelm and her Swiss and German colleagues have published their results in "Nature Neuroscience." (doi: 10.1038/nn.3343)

Studies of adults have shown that sleeping after learning supports the long-term storage of the material learned, says Dr Wilhelm. During sleep, memory is turned into a form that makes future learning easier; implicit knowledge becomes explicit and therefore becomes more easily transferred to other areas.

Children sleep longer and deeper, and they must take on enormous amounts of information every day. In the current study, the researchers examined the ability to form explicit knowledge via an implicitly-learned motor task. Children between 8 and 11, and young adults, learned to guess the predetermined series of actions – without being aware of the existence of the series itself. Following a night of sleep or a day awake, the subjects' memories were tested. The result: after a night's sleep, both age groups could remember a larger number of elements from the row of numbers than those who had remained awake in the interim. And the children were much better at it than the adults.

"In children, much more efficient explicit knowledge is generated during sleep from a previously learned implicit task, says Wilhelm. And the children's extraordinary ability is linked with the large amount of deep sleep they get at night. "The formation of explicit knowledge appears to be a very specific ability of childhood sleep, since children typically benefit as much or less than adults from sleep when it comes to other types of memory tasks."

Publication: "The sleeping child outplays the adult's capacity to convert implicit into explicit knowledge," Ines Wilhelm, Michael Rose, Kathrin I.

Imhof, Björn Rasch, Christian Büchel, Jan Born. Nature Neuroscience (2013), doi: 10.1038/nn.3343

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