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PRESS RELEASE

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SLEEP IMPROVES ADULTS' JUGGLING SKILLS, BUT NOT ADOLESCENTS'

Many research studies have shown the role of sleep in consolidating memories and processing information, and some scientists also believe sleep is also important in reinforcing motor skills. Dr Kerstin Hoedlmoser from the University of Salzburg, Austria, has been investigating whether sleep improves the ability of adolescents and young adults to juggle. She was surprised to find that age makes a significant difference.

"Twenty boys and one girl aged 12-15 years and 32 (16 men and 16 women) young adults, 19-29 years old, learned to juggle three balls," Dr Hoedlmoser explained today (3 July). Juggling requires both arms to move in a co-ordinated way to be able to grasp the balls, and for the eyes to see the balls in the peripheral field of vision.

The one-hour training consisted of 14 standardised steps. To test their skills, the participants then had to juggle three balls for three minutes, five times before and after eight hours of sleep or being a wake. Training and testing was filmed and the number of three-ball-cascades that could be performed by the adolescents and adults was counted. Their brain activity during sleep was recorded (polysomnography) and was later analysed to assess sleep stages and sleep spindles.

She found that sleep did not improve the adolescents' juggling skills. In fact, their performance decreased. In striking contrast, the adults did benefit from sleep and their ability to juggle increased but deteriorated after a period of eight hours being awake.

"We were surprised that the results showed distinct differences in the role of sleep in motor learning between adolescents and adults. We think that it could be because adolescents are less able to integrate complex sensory inputs with learning the specific movements of juggling. However, perhaps adults' capability to improve motor performance during sleep might depend on their already being elaborate representations in the brain," said Dr Hoedlmoser.

It appears that long-held views that the consolidation of memories of motor skills is dependent on sleep, especially during early brain development, are being challenged. To investigate this further, Dr Hoedlmoser plans to find out how sleep during infancy and early childhood contributes to the trajectory of learning.

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Poster: Sleep-dependent motor memory consolidation from adolescence to adulthood

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NOTES TO EDITORS

The 10th FENS Forum of Neuroscience, the largest basic neuroscience meeting in Europe, organised by FENS and hosted by the Danish Society for Neuroscience will attract an estimated 6000 international delegates. FENS mission is to advance research and education in neuroscience within and outside Europe, to facilitate interaction and coordination between its members. FENS represents 43 national and single discipline neuroscience societies with about 24,000 member scientists from 33 European countries. <http://www.fens.org/>