

Connections in the brains of young children strengthen during sleep, study finds

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While young children sleep, connections between the left and the right hemispheres of their brain strengthen, which may help brain functions mature, according to a new study by the University of Colorado Boulder.

The research team—led by Salome Kurth, a postdoctoral researcher, and Monique LeBourgeois, assistant professor in integrative physiology—used electroencephalograms, or EEGs, to measure the [brain](#) activity of eight sleeping children multiple times at the ages of 2, 3 and 5 years.

"Interestingly, during a night of sleep, connections weakened within hemispheres but strengthened between hemispheres," Kurth said.

Scientists have known that the brain changes drastically during early childhood: New connections are formed, others are removed and a fatty layer called "myelin" forms around nerve fibers in the brain. The growth of myelin strengthens the connections by speeding up the transfer of information.

Maturation of nerve fibers leads to improvement in skills such as language, attention and impulse control. But it is still not clear what role sleep plays in the development of such [brain connections](#).

In the new study, appearing online in the journal *Brain Sciences*, the researchers looked at differences in brain activity during sleep as the children got older and differences in [brain activity](#) of each child over a night's sleep. They found that connections in the brain generally became stronger during sleep as the children aged. They also found that the strength of the connections between the left and right hemispheres increased by as much as 20 percent over a night's sleep.

"There are strong indications that sleep and [brain maturation](#) are closely related, but at this time, it is

not known how sleep leads to changes in brain structure," Kurth said.

Future studies will be aimed at determining how [sleep disruption](#) during childhood may affect brain development and behavior.

"I believe inadequate [sleep](#) in childhood may affect the maturation of the brain related to the emergence of developmental or mood disorders," Kurth said.

Provided by University of Colorado at Boulder

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