

Newborn infants learn while asleep; study may lead to later disability tests

May 17 2010, by Cathy Keen

Sleeping newborns are better learners than thought, says a University of Florida researcher about a study that is the first of its type. The study could lead to identifying those at risk for developmental disorders such as autism and dyslexia.

"We found a basic form of learning in sleeping [newborns](#), a type of learning that may not be seen in sleeping adults," said Dana Byrd, a research affiliate in psychology at UF who collaborated with a team of scientists.

The findings give valuable information about how it is that newborns are able to learn so quickly from the world, when they sleep for 16 to 18 hours a day, Byrd said. "Sleeping newborns are better [learners](#), better 'data sponges' than we knew," she said.

In order to understand how newborns learn while in their most frequent state, Byrd and her colleagues tested the learning abilities of sleeping newborns by repeating tones that were followed by a gentle puff of air to the eyelids. After about 20 minutes, 24 of the 26 babies squeezed their eyelids together when the tone was sounded without the puff of air.

"This methodology opens up research areas into potentially detecting high risk populations, those who show abnormalities in the neural systems underlying this form of learning," she said. "These would include siblings of individuals with autism and siblings of those with dyslexia."

The research team's paper, published online this week in [Proceedings of the National Academy of Sciences](#), describes the results of their experiment with the 1- or 2-day-old [infants](#), comparing them with a control group using EEG and video recordings. The [brain waves](#) of the 24 infants were found to change, providing a neural measurement of memory updating.

"While past studies find this type of learning can occur in infants who are awake, this is the first study to document it in their most frequent state, while they are asleep," Byrd said. "Since newborns sleep so much of the time, it is important that they not only take in information but use the information in such a way to respond appropriately."

Not only did the newborns show they can learn to give this reflex in response to the simple tone, but they gave the response at the right time, she said.

Learned eyelid movement reflects the normal functioning of the circuitry in the cerebellum, a neural structure at the base of the brain. This study's method potentially offers a unique non-invasive tool for early identification of infants with atypical cerebellar structure, who are potentially at risk for a range of developmental disorders, including autism and dyslexia, she said.

The capacity of infants to learn during sleep contrasts with some researchers' stance that learning new material does not take place in sleeping adults, Byrd said.

The immature nature of sleep patterns in infants could help explain why, she said.

"Newborn infants' sleep patterns are quite different than those of older children or adults in that they show more active sleep where heart and

breathing rates are very changeable," she said. "It may be this sleep state is more amenable to experiencing the world in a way that facilitates learning."

Another factor is that infants' brains have greater neural plasticity, which is the ability for the neural connections to be changed, Byrd said.

"Newborns may be very adaptive to learning in general simply because their brains have increased plasticity, increased propensity to be changed by experience," she said.

Provided by University of Florida

Citation: Newborn infants learn while asleep; study may lead to later disability tests (2010, May 17) retrieved 26 April 2024 from <https://medicalxpress.com/news/2010-05-newborn-infants-asleep-disability.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.