

Fetuses may have Memories, Study Suggests

Short-term memory may be present at 30 weeks, researchers say

You probably recall little of your days in the womb, but a new study suggests that short-term memory may be present in fetuses at 30 weeks of age.

Until a few decades ago, "people would say that the human fetus is a sort of black box," said Dr. Jan Nijhuis, a co-author of the study and an obstetrician at Maastricht University Medical Center in The Netherlands. Studies over the years have started to reveal more about the neurological development of humans before they are born, but researchers are still trying to figure out when memory begins and how long it can last.

The new study tested how fetuses in nearly 100 pregnant women responded to a specific stimulus, in this case, a "vibroacoustic stimulation," which is a very low sound that makes a vibration. The researchers observed the reaction using an ultrasound. When the fetus first receives the stimulation, it is startled. But after repeated trials of the same stimulation, 30 seconds apart, the fetus gets used to the sound and doesn't react.

"A normal fetus, of about 30 or 32 or 34 weeks, would stop responding after [about] 13 or 14 stimuli," said Nijhuis.

This lessened response to a repeated stimulus is called habituation, a process that both humans and animals are known to experience. For example, you might become habituated to the sound of your heater at nighttime, hearing it at first, but growing used to the noise after a while and falling asleep, Nijhuis explained.

"Habituation is a form of learning and a form of memory," Nijhuis said. He and his colleagues used the habituation tests to examine memory in fetuses 30 to 38 weeks old. They found that 30-week-old fetuses had a "memory" of 10 minutes - if the fetuses received a second round of sound stimulation 10 minutes after the initial test, it took them a lot less time to become habituated to the noise during their second session, and they stopped responding after only a few stimuli, he said.

Retrieving Memories

The researchers also found that 34-week-old fetuses were able to "store information and retrieve it four weeks later," he said. The team came to this conclusion after performing the habituation tests at 34 weeks and then again at 38 weeks. The scientists compared the response of the 38-week-old fetuses who had been tested before with that of fetuses who had not been tested before.

"We saw this striking difference," Nijhuis said. "The fetuses who had been tested before were habituated within two or three or four stimuli, and the other fetuses of 38 weeks responded in the same way as [32 week-old fetuses who had not been tested before]," meaning it took many more stimuli to habituate the 38-week-old fetuses if they had not previously experienced the test at 34 weeks.

"So that shows that there is a sort of remembrance of 4 weeks," he said.

Previous research has shown that fetuses can habituate to sounds and that the fetus has a short-term memory of 24-hours, but this study further examined how long these memories can last.

Fetuses younger than 30 weeks do not seem to be able to habituate, Nijhuis said, although this may be because the scientists are not using the right type of stimulus, he said. Future research will work on refining their current protocol to test habituation at different times during fetal development.

Since fetuses that have developmental problems take longer to habituate than normal fetuses, these types of studies may help indicate fetuses that are at risk for certain conditions.

MSNBC.com Health - July 2009 <http://www.msnbc.msn.com/id/32013788/ns/health-pregnancy/from/ET>

The results were published in the July/August Issue of the journal Child Development.

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