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## TOOLBOX

## Child-sized brain imaging device improves data collection

BY LAURA GEGGEL

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Good fit: The customized child-sized machine (left) measures brain activity in children more accurately than does the adult-sized version (right).

A small, customized magnetoencephalography (MEG) device records signals in children's brains better than the typical adult-sized machine does, reports a study published 8 October in *Molecular Autism*<sup>1</sup>.

Using the device, researchers determined that children with autism show a less intense response in their left auditory cortex when they hear a human voice than controls do.

Until recently, researchers used the same MEG machines to study both adults and children. MEG maps the brain's activity by recording magnetic fields generated by electrical activity in the brain. The farther away its sensors are from a person's head, however, the weaker the signal.

The close-fitting headpiece of the new device can record the child's signals with increased precision, the researchers say. It also constrains head movements, which can **tarnish results of imaging studies**.

The researchers measured a brain signal related to language performance in 33 Japanese children with autism and 30 age- and gender-matched controls, aged 3 to 7 years.

The children lay on their backs and watched a silent show projected on a screen in front of them. Over an audio system, the researchers played a voice repeating the syllable "ne," which Japanese children often use when asking their mothers for acknowledgment or empathy. After the children heard the sound, the MEG recorded their brain response.

As children grow, they typically use the left hemisphere more than the right to process speech. This study found, in agreement with **earlier studies**<sup>2</sup>, that children with autism show less intense responses to sound in their left hemisphere than controls do.

What's more, the older the children in the autism group, the faster their response to sound in the right hemisphere.

It's possible that the faster response in older children is related to increased myelin, the sheath that surrounds nerve cells and helps speed the transmission of electrical signals. Myelin levels typically increase as children develop into teenagers.

Interestingly, a faster response in both hemispheres is linked to higher language performance in the controls, but not in the autism group. The study suggests that the differences in the auditory cortex of children with autism are independent of language development.

## **References:**

- 1: Yoshimura Y. et al. Mol. Autism 4, 38 (2013) PubMed
- 2: Pihko E. et al. Int. J. Psychophysiol. 68, 161-169 (2008) PubMed