

Age and sex affect infant brain structure

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Infant brain development is still poorly understood. Thus, research on the topic is vital as developing brains are sensitive to early environmental factors. Recognising this, the FinnBrain imaging study conducted in Turku explores brain structure in newborns.

Adult [brain structure](#) and the division of different functions between the hemispheres is already well studied. However, information on the developing brains of newborns is still limited, even though understanding this normal developmental process is important. Through understanding this process, future studies can more easily detect the effects that environmental factors, such as maternal prenatal health, may have on the infant [brain](#).

"The developing brain is most sensitive to environmental factors during pregnancy, and these factors may drastically alter the course of development," says Doctoral Candidate, Lic. Med. Satu Lehtola from the FinnBrain Birth Cohort Study at the University of Turku.

In the study, 68 babies aged two to five weeks were scanned using MRI. To investigate normal [infant brain development](#), lobar volumes and their

hemispheric differences, i.e. asymmetry, were explored. The effects of age and sex on lobar volumes and asymmetry were of particular interest.

"We observed that in both sexes, the lobes were asymmetric in the same way: the right temporal lobe, left parietal, and left occipital lobes were larger than their counter side. Differences between sexes were found, but they were subtle and included only locally restricted areas in the gray matter," says Lehtola.

In the findings, the effect of age manifested as different growth rates between gray and [white matter](#), which aligns with existing research showing that the growth rate of gray matter is more rapid during the first years of life. When disaggregating [gray matter](#) into lobar volumes though, the lobar volumes of full-term [infants](#) did not differ in a statistically significant manner as infants' ages only varied by a few weeks.

"Not many studies on this topic have been carried out with such young infants, yet our results are in line with the previous findings and thus strengthen and broaden our perceptions on early brain development. The results provide a good basis to continue research on the effects of early [environmental factors](#) on brain volumes, which is a key aim of the FinnBrain research project," says Lehtola.

More information: S. J. Lehtola et al. Associations of age and sex with brain volumes and asymmetry in 2–5-week-old infants, *Brain Structure and Function* (2018). DOI: [10.1007/s00429-018-1787-x](https://doi.org/10.1007/s00429-018-1787-x)

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