More left-handed men are born during the winter, study says

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The front and back of a human right hand. Credit: Wikipedia.

Men born in November, December or January are more likely of being left-handed than during the rest of the year. While the genetic bases of handedness are still under debate, scientists at the Faculty of Psychology, University of Vienna, obtained indirect evidence of a hormonal mechanism promoting left-handedness among men. Psychologist Ulrich Tran and his colleagues published their findings in the scientific journal

Cortex.

Various manual tasks in everyday life require the use of the right hand or are optimized for right-handers. Around 90 percent of the general population is right-handed, only about 10 percent is left-handed. The study of Ulrich Tran, Stefan Stieger, and Martin Voracek comprised two large and independent samples of nearly 13000 adults from Austria and Germany. As in modern genetic studies, where a discovery-and-replication-sample design is standard, the use of two samples allowed testing the replicability and robustness of findings within one-and-the-same study. Overall, 7.5 percent of women and 8.8 percent of men were left-handed. "We were surprised to see that this imbalance was caused by more left-handed men being born specifically during November, December, and January. On a monthly average, 8.2 percent of left-handed men were born during the period February to October. During November to January, this number rose to 10.5 percent", according to Ulrich Tran, lead author of the study.

A hormonal cause during embryonic development

"Presumably, the relative darkness during the period November to January is not directly connected to this birth seasonality of handedness. We assume that the relative brightness during the period May to July, half a year before, is its distal cause", explains Ulrich Tran. A theory, brought forth in the 1980s by US neurologists Norman Geschwind and Albert Galaburda, posits that testosterone delays the maturation of the left brain hemisphere during embryonic development. The left brain hemisphere is dominant among right-handers, the right brain hemisphere is dominant among left-handers. Intrauterine testosterone levels are higher in the male fetus, because of its own testosterone secretion, than in the female fetus. However, the testosterone level of the mother and external factors may also affect intrauterine testosterone levels. Specifically, more daylight may increase testosterone levels, making a

seasonality effect plausible.

Previous studies on the subject provided mixed and inconsistent evidence. There was no clear indication which season has an effect, and whether seasonality affects men, women or both sexes equally. According to the current findings, there is a small, but robust and replicable, effect of birth seasonality on handedness, affecting only men. These results are consistent with a hormonal basis of handedness, corroborating thus an old and controversial theory. However, the exact way of causation needs to be investigated in future studies.

More information: Latent variable analysis indicates that seasonal anisotropy accounts for the higher prevalence of left-handedness in men. Ulrich S. Tran, Stefan Stieger, Martin Voracek. *Cortex*, 57, 188-197, 2014. DOI: dx.doi.org/10.1016/j.cortex.2014.04.011

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