

# Strict parenting may hard-wire depression risk into a child's DNA

October 18 2022

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Strict parenting can alter the way the body reads the DNA of children. These changes can effectively become "hard-wired" to the DNA of those children who perceive their parents as harsh, increasing their biological

risk for depression in adolescence and later life.

Presenting the work at the ECNP Congress in Vienna, Dr. Evelien Van Assche said, "We discovered that perceived harsh parenting, with physical punishment and psychological manipulation, can introduce an additional set of instructions on how a gene is read to become hard-wired into DNA. We have some indications that these changes themselves can predispose the growing child to depression. This does not happen to the same extent if the children have had a supportive upbringing."

The researchers, from the University of Leuven in Belgium, selected 21 adolescents who reported good parenting (for example, the parents being supportive and giving the children autonomy), and compared them with 23 adolescents who reported harsh parenting (for example, manipulative behavior, [physical punishment](#), excessive strictness). All adolescents were between 12 and 16 years old, with a mean of 14 years for both groups. For both groups 11 adolescents were boys meaning that the two groups were comparable, with a similar age and a similar, boy-girl distribution. Many of those who had experienced harsh parenting showed initial, subclinical signs of depression.

The researchers then measured the range of methylation at more than 450,000 places in the DNA of each subject and found that this was significantly increased in those who reported a harsh upbringing. Methylation is a normal process which occurs when a small chemical molecule is added to the DNA, changing the way that the instructions written in your DNA are read: for example, methylation may increase or decrease the amount of an enzyme produced by a gene.

Increased variation in methylation is known to be associated with depression. Evelien Van Assche said, "We based our approach on prior research with identical twins. Two [independent groups](#) found that the

twin diagnosed with [major depression](#) also had a higher range of DNA methylation for the majority of these hundreds of thousands of data points, as compared to the healthy twin."

Dr. Van Assche (now working at the University of Munster, Germany) continued, "The DNA remains the same, but these additional chemical groups affect how the instructions from the DNA are read. Those who reported harsher parenting showed a tendency towards depression, and we believe that this tendency has been baked into their DNA through increased variation in methylation. We are now seeing if we can close the loop by linking it to a later diagnosis of depression and perhaps use this increased methylation variation as a marker, to give advance warning of who might be at greater risk of developing depression as a result of their upbringing."

"In this study we investigated the role of harsh parenting, but it's likely that any significant stress will lead to such changes in DNA methylation; so in general, stresses in childhood may lead to a general tendency to [depression](#) in later life by altering the way your DNA is read. However these results need to be confirmed in a larger sample."

Professor Christiaan Vinkers, Department of Psychiatry, Amsterdam University Medical Center, who was not involved in the study, said, "This is extremely important work to understand the mechanisms how adverse experiences during childhood have life-long consequences for both mental health and physical health. There is a lot to gain if we can understand who is at risk, but also why there are differing effects of strict parenting."

**More information:** This work is presented at the 35th European College of Neuropsychopharmacology annual conference, which takes place in Vienna and online from 15–18 October, see [www.ecnp.eu/Congress2022/ECNPcongress](http://www.ecnp.eu/Congress2022/ECNPcongress).

Provided by European College of Neuropsychopharmacology

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