

Family problems experienced in childhood and adolescence affect brain development

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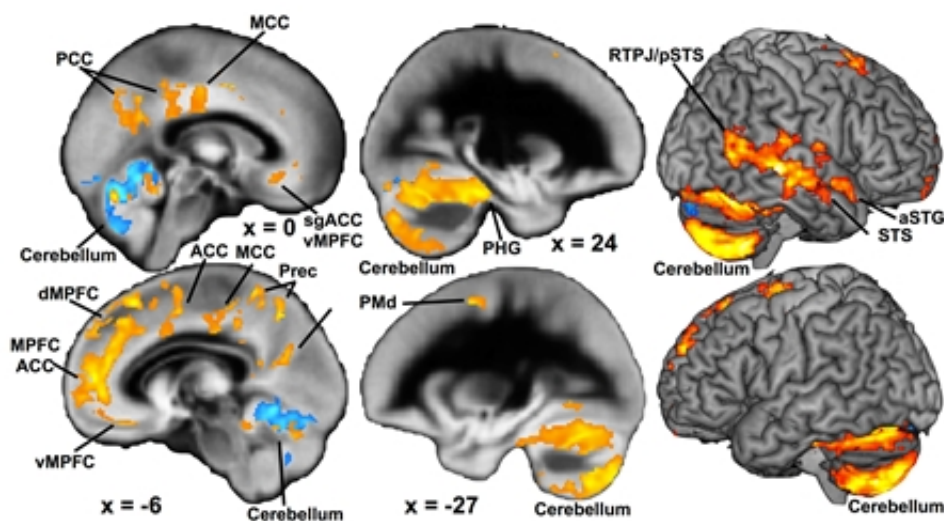


Image: Areas in blue are brain regions shown to be smaller as a result of childhood adversities occurring aged 0-11, and regions in orange are shown to be larger as a result of exposure to negative life events aged 14.

(Medical Xpress)—New research has revealed that exposure to common family problems during childhood and early adolescence affects brain development, which could lead to mental health issues in later life.

The study led by Dr Nicholas Walsh, lecturer in developmental psychology at the University of East Anglia, used brain imaging technology to scan teenagers aged 17-19. It found that those who experienced mild to moderate family difficulties between birth and 11

years of age had developed a smaller cerebellum, an area of the brain associated with skill learning, stress regulation and sensory-motor control. The researchers also suggest that a smaller cerebellum may be a risk indicator of psychiatric disease later in life, as it is consistently found to be smaller in virtually all [psychiatric illnesses](#).

Previous studies have focused on the effects of severe neglect, abuse and maltreatment in childhood on [brain development](#). However the aim of this research was to determine the impact, in currently healthy teenagers, of exposure to more common but relatively chronic forms of 'family-focused' problems. These could include significant arguments or tension between parents, physical or emotional abuse, lack of affection or communication between family members, and events which had a practical impact on daily family life and might have resulted in health, housing or school problems.

Dr Walsh, from UEA's School of Psychology, said: "These findings are important because exposure to adversities in childhood and adolescence is the biggest risk factor for later psychiatric disease. Also, psychiatric illnesses are a huge public health problem and the biggest cause of disability in the world.

"We show that exposure in childhood and early adolescence to even mild to moderate family difficulties, not just severe forms of abuse, neglect and maltreatment, may affect the developing adolescent brain. We also argue that a smaller cerebellum may be an indicator of [mental health issues](#) later on. Reducing exposure to adverse social environments during early life may enhance typical brain development and reduce subsequent mental health risks in adult life."

The study, which was conducted with the University of Cambridge and the Medical Research Council Cognition and Brain Sciences Unit, Cambridge, is published in the journal *NeuroImage: Clinical*.

The 58 teenagers who took part in the brain scanning were drawn from a larger study of 1200 young people, whose parents were asked to recall any negative life events their children had experienced between birth and 11 years of age. The interviews took place when the children were aged 14 and of the 58, 27 were classified as having been exposed to childhood adversities. At ages 14 and 17 the teenagers themselves also reported any negative events and difficulties they, their family or closest friends had experienced during the previous 12 months.

A "significant and unexpected" finding was that the participants who reported stressful experiences when aged 14 were subsequently found to have increased volume in more regions of the brain when they were scanned aged 17-19. Dr Walsh said this could mean that mild stress occurring later in development may 'inoculate' teenagers, enabling them to cope better with exposure to difficulties in later life, and that it is the severity and timing of the experiences that may be important.

"This study helps us understand the mechanisms in the brain by which exposure to problems in early-life leads to later psychiatric issues," said Dr Walsh. "It not only advances our understanding of how the general psychosocial environment affects brain development, but also suggests links between specific regions of the brain and individual psychosocial factors. We know that psychiatric risk factors do not occur in isolation but rather cluster together, and using a new technique we show how the general clustering of adversities affects brain development."

The researchers also found that those who had experienced family problems were more likely to have had a diagnosed psychiatric illness, have a parent with a [mental health](#) disorder and have negative perceptions of their how their family functioned.

More information: "General and specific effects of early-life psychosocial adversities on adolescent grey matter," Walsh, N D,

Dagleish, T, Lombardo, M V, Dunn, V J, Van Harmelen, A, Ban, M, Goodyer, I M, is published in *NeuroImage: Clinical*, volume 4 (2014) p 308-318.

Provided by University of East Anglia

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