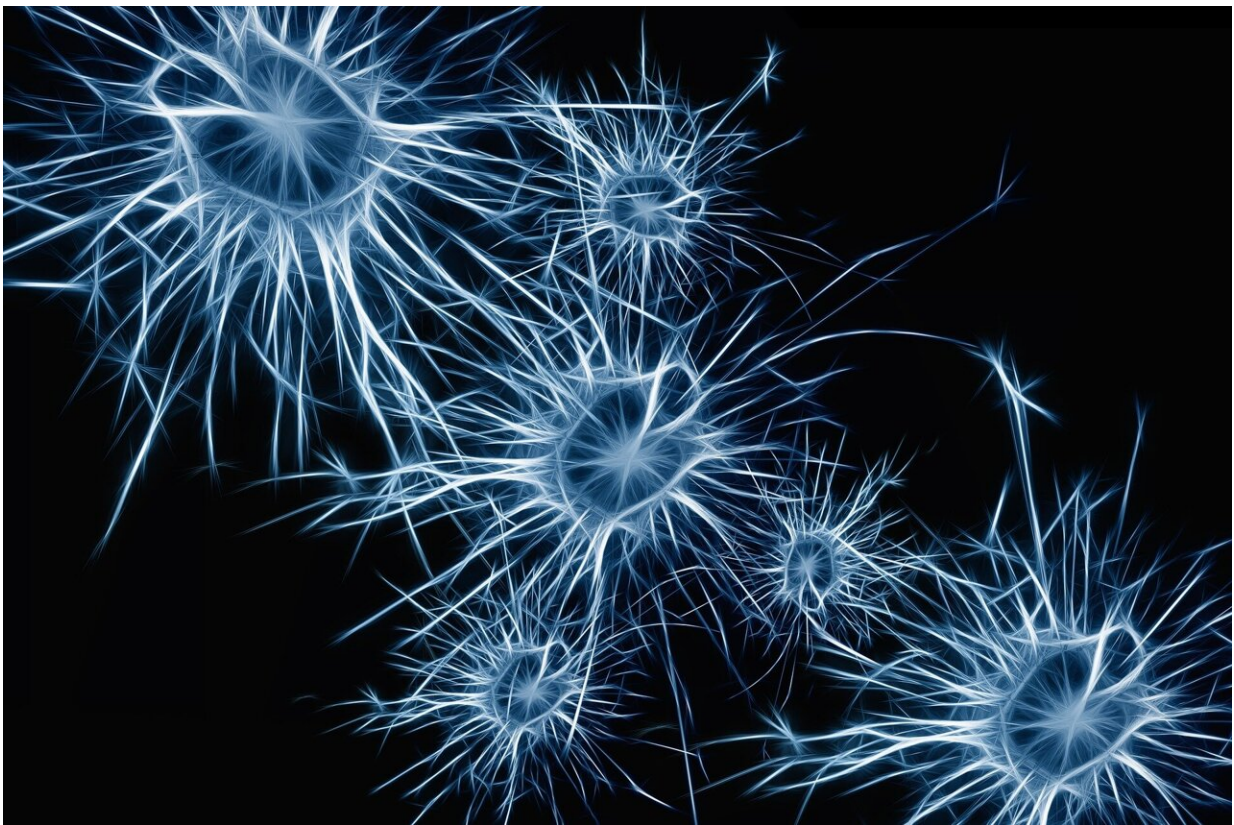


Differences in brain structure between siblings make some more susceptible to developing severe antisocial behaviour

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Structural differences in the area of the brain responsible for decision making could explain why two siblings living in the same family might

differ in their risk of developing the condition conduct disorder.

Psychologists and neuroscientists have long puzzled over why siblings with seemingly the same upbringing and genetic makeup might differ so significantly in terms of their [behavior](#): how do some young people growing up in families with antisocial or [criminal behavior](#) manage to stay out of trouble (the 'white sheep' of the family)?

Researchers at the universities of Bath and Southampton investigated this question by studying different members of the same families—some with the mental health condition [conduct disorder](#), and some with no behavioral problems.

Conduct disorder is characterized by repetitive patterns of aggressive and antisocial behavior. It results in substantial personal and financial costs for affected individuals, their families and society in general and is one of the most common reasons for referral to Child and Adolescent Mental Health Services in the UK.

Conduct disorder has a prevalence rate of around 5% among young people aged between 5 and 16, although there is a steep social class gradient: a 2004 survey revealed almost 40% of looked-after children, those who had been abused or on safeguarding registers, had conduct disorder. Despite all this, general awareness of the condition remains low and it is not recognized by many psychologists or psychiatrists.

The new study, published today in the journal *Psychological Medicine*, sought to understand underlying mechanisms which might determine someone's risk of developing the condition. The international team, including Dr. Graeme Fairchild at the University of Bath, conducted MRI [brain](#) scans on 41 adolescents with conduct disorder, 24 unaffected siblings (who had a brother or sister with conduct disorder but did not show the condition themselves) and 38 typically developing controls with

no family history of conduct disorder.

Their analysis found that [young people](#) with conduct disorder and their relatives both displayed structural differences in the brain—in a part of the brain called the inferior parietal cortex. However, there were also structural changes in the brain that were specific to the conduct disorder group in brain regions responsible for empathy and cognitive control / inhibiting behavior that were not found in the unaffected siblings.

In addition, the researchers also found changes in the prefrontal cortex, a brain area involved in planning and decision-making, that were specific to the unaffected [sibling](#) group—which may explain why they are protected from showing antisocial behavior despite growing up with either environmental or genetic risk factors for conduct disorder. Previous work from the same team found that despite differences in antisocial behavior between siblings, both those with conduct disorder and their unaffected siblings had difficulties in recognizing emotional facial expressions.

Dr. Graeme Fairchild from the University of Bath's Department of Psychology explains: "Our study aimed to understand the root causes of conduct disorder, specifically what makes members of the same family differ in their [antisocial behavior](#) and are there genetic risk markers for conduct disorder in the brain.

"This is one of the first family-based studies of conduct disorder and it confirms that the brain is important for distinguishing between members of the same [family](#) who are at higher risk of developing antisocial or criminal behavior.

"Interestingly, whilst our previous work showed common impairments between affected and unaffected siblings in recognizing facial expressions, this study suggests that key behavioral differences may be

determined by small changes in the part of the brain responsible for executive functioning or decision-making. These differences could make some siblings more prone to risky behavior and should now be a focus of future study."

The authors hope their findings can in time help guide early interventions for the younger siblings of teenagers with [conduct](#) disorder, helping them to access help and treatment at an earlier age.

More information: Neuroanatomical markers of familial risk in adolescents with conduct disorder and their unaffected relatives, *Psychological Medicine* (2021). [DOI: 10.1017/S0033291721003202](https://doi.org/10.1017/S0033291721003202)

Provided by University of Bath

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