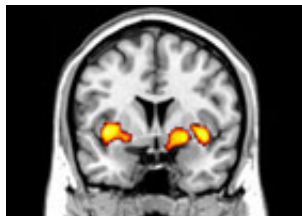


# Study reveals brain changes in teenage girls with severe antisocial behaviour

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Teenage girls with severe antisocial behaviour show abnormal changes in the structure of their brains, according to a study published today. The findings support previous studies in boys that suggested the brains of teenagers with behaviour problems may operate differently, and they could also explain why boys are more likely than girls to develop behaviour problems.

Conduct disorder is a [psychiatric condition](#) that affects around five out of every 100 teenagers in the UK. It manifests as increased aggressive and [antisocial behaviour](#) during childhood or adolescence, and those affected are at greater risk of developing further mental and physical health problems in later life. Rates of conduct disorder and violent crime have risen significantly among [adolescent girls](#) in recent years, whereas levels in boys have remained around the same.

Previous studies have reported [brain differences](#) in teenage boys with conduct disorder, but this is the first study to look at girls. With funding from the Wellcome Trust and Medical Research Council, the team of researchers compared brain scans of 22 [female adolescents](#) with conduct disorder with 20 typically developing females of the same age.

They also tested for [sex differences](#) by comparing their results with previous brain scans of male adolescents with conduct disorder. Their findings broadly overlap with those that have previously

been reported in boys, revealing differences in the size of areas of the brain involved in empathy, [emotion recognition](#) and self-control.

They found that a structure called the [amygdala](#) was smaller in the brains of teenagers with conduct disorder than their peers, regardless of gender. However, whereas girls with conduct disorder had less [grey matter](#) in an area of the brain called the insula, the same area was larger in boys with conduct disorder than control teenagers.

Together, the findings provide further evidence that there may be a biological basis for severe antisocial behaviour and could explain why boys are more likely to develop conduct disorder than girls.

Dr Graeme Fairchild, the first author on the study, said: "Although there have now been several brain imaging studies of boys with antisocial behaviour, very little is known about the [biological basis](#) of antisocial behaviour in girls. We also know little about the causes of sex differences in antisocial behaviour and violence, even though boys are far more likely to develop behaviour problems than girls.

"We believe that this study is an important first step towards understanding the role of neurological factors in the development of antisocial behaviour in girls."

The researchers also looked at girls with the least and most severe symptoms and observed an increasing pattern of abnormality as the symptoms in the individual get worse. This suggests a relationship between the severity of the condition and the degree of structural change in the brain.

"The origins of these changes could be due to being born with a particular brain dysfunction or it could be due to exposure to adverse environments, such as a distressing experience early in life, that could have an impact on the way the brain

develops," said Dr Andy Calder, a coauthor on the study based at the MRC Cognition and Brain Sciences Unit.

Professor Ian Goodyer, who led the research at the University of Cambridge, said: "It costs the Government ten times as much to support a child with [conduct disorder](#) into adulthood compared to a child without behaviour problems.

"At the moment we don't know whether these changes in the brain are a cause or a consequence of the behavioural problems, but we do know that early identification of a biological abnormality may be a route to take in terms of targeting early intervention even before adolescence."

The study is published today in the *Journal of Child Psychology and Psychiatry*.

**More information:** Fairchild G et al. Brain structure abnormalities in adolescent girls with conduct disorder. *J Child Psychol Psychiatry* 2012.

Provided by Wellcome Trust

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