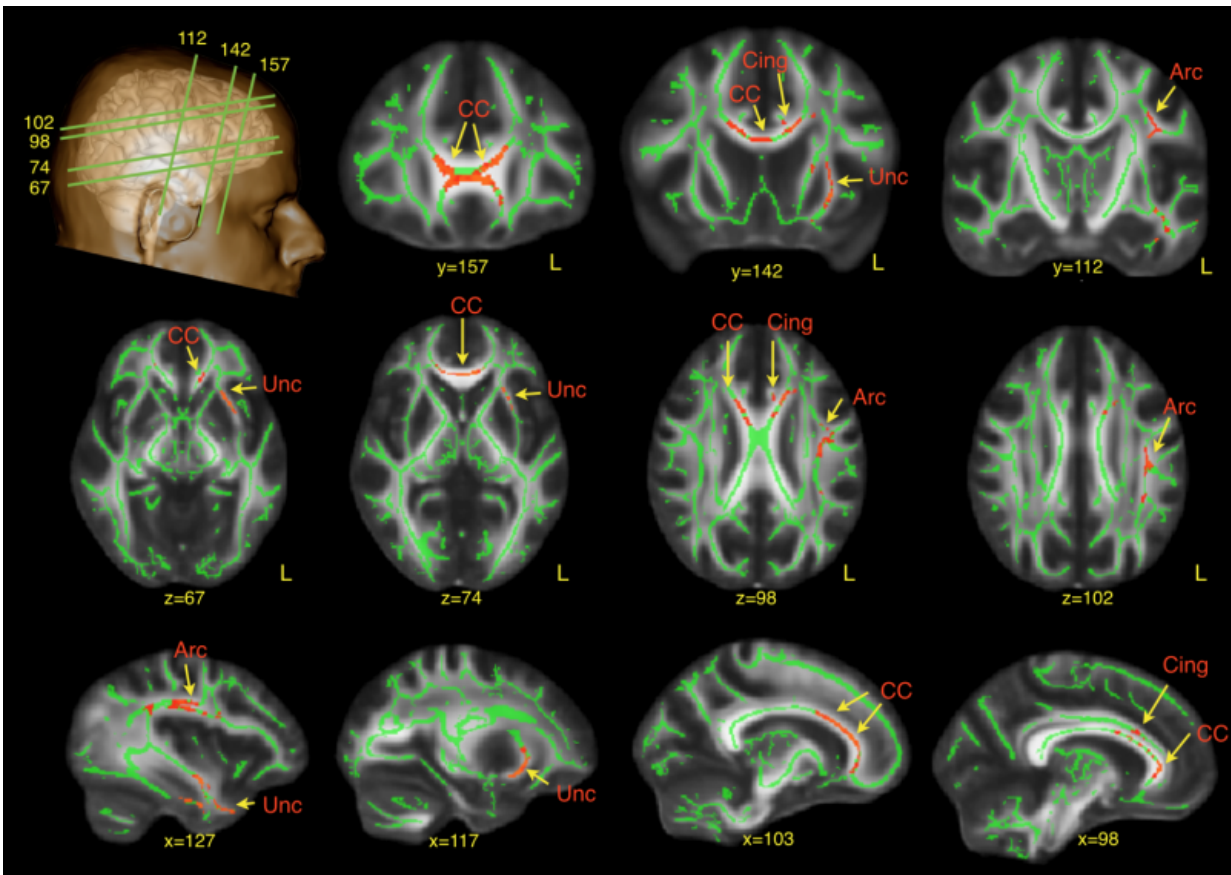


Study reveals subtle brain differences in men with autism

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Red regions indicate reduced fractional anisotropy values in autism spectrum disorder (ASD). Credit: King's College London

Research at King's College London has revealed subtle brain differences

in adult males with autism spectrum disorder (ASD), which may go some way towards explaining why symptoms persist into adulthood in some people with the disorder.

ASD affects around 1 in 100 people in the UK and involves a spectrum of conditions which manifest themselves differently in different people. People with ASD can have varying levels of impairment across three common areas, which might include: deficits in social interactions and reciprocal understanding, repetitive behaviour and narrow interests, and impairment in language and communication.

The study, published today in the journal *Brain*, used a novel [brain](#) imaging method to identify altered [brain connections](#) in people with ASD. The researchers used Diffusion Tensor Imaging (DTI), a Magnetic Resonance Imaging (MRI) technique, to compare networks of [white matter](#) in 61 adults with ASD and 61 controls. White matter consists of large bundles of nerve cells that connect different regions of the brain and enable communication between them.

The scans revealed that men with ASD had differences in brain connections in the frontal lobe, a part of the brain that is crucial to developing language and social interaction skills.

Specifically, these men had altered development of white matter connections in the left side of the brain, the arcuate bundle, which is involved in language. The differences in the arcuate bundle, which connects areas of the brain involved in understanding words and regions related to speech production, were particularly severe in those who had a significant history of 'delayed echolalia'. Delayed echolalia is very common in ASD and manifests in the parrot-like repetition of words or sentences.

ASD was also associated with underdevelopment of white matter in the

left uncinate bundle, which plays a significant role in face recognition and emotional processing. This also correlated with observations of 'inappropriate use of facial expression' in childhood.

Dr Marco Catani from the Institute of Psychiatry, Psychology & Neuroscience (IoPPN) at King's College London, said: "White matter provides key insights which allow us to paint a precise picture of how different parts of the brain develop during critical periods in childhood.

"We found subtle [brain differences](#) in men who at a very young age had severe problems with communication and social interaction. The differences appear to remain even if they have somehow learned to cope with these difficulties in adult life.

"It is worth noting that the brain differences are visible only with the special research techniques we now have at our disposal. These differences are very subtle and potentially reversible. Thanks to neuroimaging studies like this, it may one day be possible to stimulate the development of these faulty brain connections, or to predict how people with autism respond to treatment."

Dr Catani added: "Our study did not include women and children, so it would be interesting to explore whether similar differences exist within these groups. For example, research has shown that women appear more resilient than men when it comes to autism, so it will be important if this is explained biologically in their brain development."

Provided by King's College London

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