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## Brain shape can predict personality traits

London, Jan 25 (PTI) The shape of our brain can predict personality traits such as altruism, openness and conscientiousness, as well as our risk of developing mental health disorders, suggests a new study

By [Press Trust of India](#) | Published: January 25, 2017 2:42 PM IST



india.com

London, Jan 25 (PTI) The shape of our brain can predict personality traits such as altruism, openness and conscientiousness, as well as our risk of developing mental health disorders, suggests a new study published today.

Researchers have analysed a brain imaging dataset from over 500 individuals.

They looked at differences in the brain cortical anatomy (the structure of the outer layer of the brain) as indexed by three measures – the thickness, area, and amount of folding in the

cortex – and how these measures related to the Big Five personality traits.

Human personality can be broken down into 'Big Five' personality traits: neuroticism (how moody a person is), extraversion (how enthusiastic a person is), agreeableness (a measure of altruism), openness (how open-minded a person is) and conscientiousness (a measure of self-control).

"Evolution has shaped our brain anatomy in a way that maximizes its area and folding at the expense of reduced thickness of the cortex," said Luca Passamonti from the University of Cambridge in the UK.

"It's like stretching and folding a rubber sheet – this increases the surface area, but at the same time the sheet itself becomes thinner. We refer to this as the 'cortical stretching hypothesis,'" said Passamonti.

"Cortical stretching is a key evolutionary mechanism that enabled human brains to expand rapidly while still fitting into our skulls, which grew at a slower rate than the brain," said Antonio Terracciano from Florida State University in the US.

"This same process occurs as we develop and grow in the womb and throughout childhood, adolescence, and into adulthood: the thickness of the cortex tends to decrease while the area and folding increase," Terracciano said.

As we get older, neuroticism goes down – we become better at handling emotions – but conscientiousness and agreeableness go up – we become more responsible and less antagonistic.

Researchers found that high levels of neuroticism, which may predispose people to develop neuropsychiatric disorders, were associated with increased thickness as well as reduced area and folding in some regions of the cortex such as the prefrontal-temporal cortices at the front of the brain.

Openness, a personality trait linked with curiosity, creativity and a preference for variety and novelty, was associated with the opposite pattern, reduced thickness and an increase in area and folding in some prefrontal cortices.

"Our work supports the notion that personality is, to some degree, associated with brain maturation, a developmental process that is strongly influenced by genetic factors," said Roberta Riccelli from Italy.

"The fact that we see clear differences in brain structure which are linked with differences in personality traits suggests that there will almost certainly be an element of genetics involved," said Nicola Toschi from the University of Rome Tor Vergata.

"This is also in keeping with the notion that differences in personality traits can be detected early on during development, for example in toddlers or infants," said Toschi.

*This is published unedited from the PTI feed.*

Published Date: January 25, 2017 2:42 PM IST