

Brain Structure Corresponds to Personality

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Personalities come in all kinds. Now psychological scientists have found that the size of different parts of people's brains correspond to their personalities; for example, conscientious people tend to have a bigger lateral prefrontal cortex, a region of the brain involved in planning and controlling behavior.

Psychologists have worked out that all personality traits can be divided into five factors, commonly called the Big Five: conscientiousness, extraversion, neuroticism, agreeableness, and openness/intellect. Colin DeYoung at the University of Minnesota and colleagues wanted to know if these personality factors correlated with the size of structures in the brain.

For the study, 116 volunteers answered a questionnaire to describe their personality, then had a brain imaging test that measured the relative size of different parts of the brain. A computer program was used to warp each brain image so that the relative sizes of different structures could be compared. Several links were found between the size of certain brain regions and personality. The research appears in *Psychological Science*, a journal of the Association for Psychological Science.

For example, "Everybody, I think, has a common sense of what extraversion is – someone who is talkative, outgoing, brash," says DeYoung. "They get more pleasure out of things like social interaction, amusement parks, or really just about anything, and they're also more motivated to seek reward, which is part of why they're more assertive." That quest for reward is thought to be a leading factor in extraversion. Earlier studies had found parts of the brain that are active in considering rewards. So DeYoung and his colleagues reasoned that those regions should be bigger in people who are more extraverted. Indeed, they found that one of those regions, the medial orbitofrontal cortex – it's just above and behind the eyes – was significantly larger in study subjects with a lot of extraversion.

The study found similar associations for conscientiousness, which is associated with planning; neuroticism, a tendency to experience negative emotions that is associated with sensitivity to threat and punishment; and agreeableness, which relates to parts of the brain that allow us to understand each other's emotions, intentions, and mental states. Only openness/intellect didn't associate clearly with any of the predicted brain structures.

"This starts to indicate that we can actually find the biological systems that are responsible for these patterns of complex behavior and experience that make people individuals," says DeYoung. He points out, though, that this doesn't mean that your personality is fixed from birth; the brain grows and changes as it grows. Experiences change the brain as it develops, and those changes in the brain can change personality.