

Could brain size determine whether you are good at maintaining friendships?

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Being popular is linked to an ability to 'mind-read'

(Medical Xpress) -- Researchers are suggesting that there is a link between the number of friends you have and the size of the region of the brain – known as the orbital prefrontal cortex – that is found just above the eyes.

A new study, published today in the journal [Proceedings of the Royal Society B](#), shows that this brain region is bigger in people who have a larger number of [friendships](#).

The research was carried out as part of the British Academy Centenary 'Lucy to Language' project, led by Professor Robin Dunbar of the University of Oxford in a collaboration with Dr Penny Lewis at The University of Manchester, Dr Joanne Powell and Dr Marta Garcia-Finana at Liverpool University, and Professor Neil Roberts at Edinburgh

University.

The study suggests that we need to employ a set of cognitive skills to maintain a number of friends (and the keyword is ‘friends’ as opposed to just the total number of people we know). These skills are described by social scientists as ‘mentalising’ or ‘mind-reading’– a capacity to understand what another person is thinking, which is crucial to our ability to handle our complex social world, including the ability to hold conversations with one another. This study, for the first time, suggests that our competency in these skills is determined by the size of key regions of our brains (in particular, the frontal lobe).

Professor Dunbar, from the Institute of Cognitive and Evolutionary Anthropology, explained: “‘Mentalising’ is where one individual is able to follow a natural hierarchy involving other individuals’ mind states. For example, in the play ‘Othello’, Shakespeare manages to keep track of five separate mental states: he intended that his audience believes that Iago wants Othello to suppose that Desdemona loves Cassio [the italics signify the different mind states]. Being able to maintain five separate individuals’ mental states is the natural upper limit for most adults.”

The researchers took anatomical MR images of the brains of 40 volunteers at the Magnetic Resonance and Image Analysis Research Centre at the University of Liverpool to measure the size of the prefrontal cortex, the part of the brain used in high-level thinking. Participants were asked to make a list of everyone they had had social, as opposed to professional, contact with over the previous seven days. They also took a test to determine their competency in mentalising.

Professor Dunbar said: “We found that individuals who had more friends did better on mentalising tasks and had more neural volume in the orbital frontal cortex, the part of the forebrain immediately above the eyes. Understanding this link between an individual’s brain size and the

number of friends they have helps us understand the mechanisms that have led to humans developing bigger brains than other primate species. The frontal lobes of the brain, in particular, have enlarged dramatically in humans over the last half million years.”

Dr Penny Lewis, from the School of Psychological Sciences at The University of Manchester, said: “Both the number of friends people had and their ability to think about other people’s feelings predicted the size of this same small brain area. This not only suggests that we’ve found a region which is critical for sociality, it also shows that the link between brain anatomy and social success is much more direct than previously believed.”

Dr Joanne Powell, from the Department of Psychology, University of Liverpool, said: “Perhaps the most important finding of our study is that we have been able to show that the relationship between [brain size](#) and social network size is mediated by mentalising skills. What this tells us is that the size of your brain determines your social skills, and it is these that allow you to have many friends.”

Dr Lewis added: “This research is particularly important because it provides the strongest support to date for the social brain hypothesis – that is, the idea that human brains evolved to accommodate the social demands of living in a big group. Cross-species comparisons between various monkey brains have already supported this, but our work is some of the first to show that people with larger social groups actually have more neural matter in this particular bit of cortex. It looks as though size really does matter when it comes to social success.”

More information: ‘Orbital Prefrontal cortex volume predicts social network size: an imaging study of individual differences in humans,’ is by Joanne Powell of the University of Liverpool; Penny Lewis of The University of Manchester; Neil Roberts of the University of Edinburgh;

Marta Garcia-Finana of the University of Liverpool, and Robin Dunbar of the University of Oxford. It will be published on 1 February 2012 by the journal *Proceedings of the Royal Society B*.

Provided by University of Manchester

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