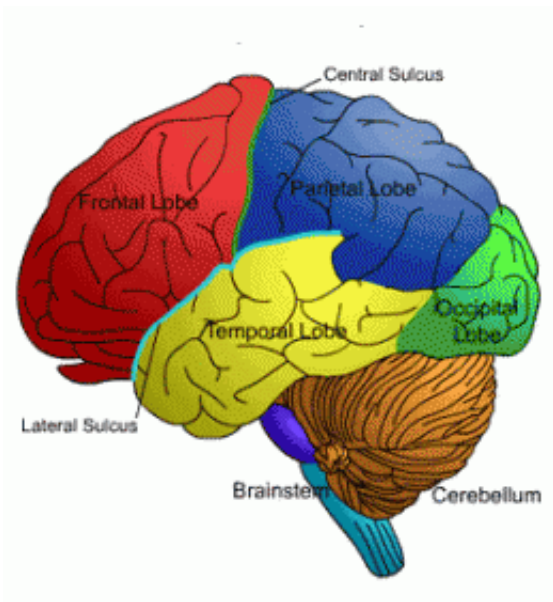


Scientists show how bigger brains could help us see better

June 25 2014



Brain diagram. Credit: dwp.gov.uk

(Medical Xpress)—Bigger brain areas could have evolved to help us perceive more, and more accurately, according to a new study published by scientists at the University of Bath.

It has become increasingly common to hear reports that big brains are not necessary, or even an evolutionary fluke. However, a new article from psychologists at Bath found that increases in the size of brain areas, such as the [visual cortex](#), are an essential element of evolution.

As part of the study, the researchers found that an increase in the size of the visual part of the brain in different primate species, including humans, apes, and monkeys, is associated with enhanced visual processing.

It is controversial whether overall brain size can predict intelligence. However the size of specialised areas within the brain is associated with specific changes in behaviour such as reducing the susceptibility to visual illusions and increasing the [visual acuity](#) or fine details that can be seen.

First author, Dr Alexandra de Sousa of the University's Department of Psychology explained: "Primates with a bigger visual cortex have better visual resolution, the precision of vision, and reduced [visual illusion](#) strength. In essence, the bigger the brain area, the better the visual processing ability.

"The size of brain areas predicts not only the number of neurons (brain cells) in that area, but also the likelihood of connections between neurons. These connections allow for increasingly complex computations to be made that allow for more accurate, and more difficult, visual perception."

Co-author, Dr Michael Proulx, Senior Lecturer (Associate Professor) in Psychology at Bath added: "This paper is a novel attempt to bring together the micro and macro anatomy of the brain with behavior. We link visual abilities, the size of brain areas, and the number of neurons that make up those [brain areas](#) to provide a framework that ties brain structure and function together.

"The theory of brain size that we discuss can be tested in the future with more behavioral tests of other species, gathering more comparative neuroanatomical data, and by testing other senses and multisensory

perception, too. We might be able to even predict how well extinct species could sense the world based on fossil data."

For the study, Dr Alexandra de Sousa, an expert in brain evolution, provided [brain size](#) measurements from her and other's neuroanatomical research. Dr Michael Proulx, an expert in perception, found psychological studies of visual illusions and visual acuity in the same species or general of animals.

The paper '*What can volumes reveal about human brain evolution? A framework for bridging behavioral, histometric and volumetric perspectives*' is published in [Frontiers in Neuroanatomy](#) this Wednesday 25 June - an online, open access journal.

Provided by University of Bath

Citation: Scientists show how bigger brains could help us see better (2014, June 25) retrieved 1 May 2024 from <https://medicalxpress.com/news/2014-06-scientists-bigger-brains.html>

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