The Unique Human Brain

The human brain is selective about the things it pays attention to. Our senses are constantly attacked by smells, colours, tastes, and sounds, and much of that information has to be filtered out, so we can focus on the important things that can keep us alive. But humans aren't the only animals who need to focus on certain signals to stay alive, so what sets us apart?

As it turns out, when humans and macaques focus on the same task their brains work differently, a small study published recently shows. The finding reveals that the human attention network probably expanded over time. And that's a pretty important piece of our evolutionary puzzle — especially given how often scientists use the macaque brain to study our own.

During the test the humans and the monkeys had to memorise a picture, like a green car, for instance. Then, they were told to fixate on a point in the centre of a computer screen. As the monkeys and the humans stared at the point, a stream of images appeared in various parts of the screen at a rate of about 10 objects per second. The goal was to push a button whenever they saw the green car appear.

The data captured during the test showed that the region of the human brain that plays a key role in redirecting attention doesn't have an equivalent in the macaque brain. The researchers also found that some brain areas were more active in humans than in macaques during this task. Finally, there was more communication between the two brain hemispheres in humans compared with the macaques — a finding that researchers think was surprising.

The increased communication doesn't necessarily mean that the way the human brain operates is better, however. Sharing information with other parts of the brain may reduce the speed of certain processes in humans. If that's the case, it may mean that being able to react quickly to a predator's approach, for instance, matters more for macaques. Humans, on the other hand, may have traded speed for some kind of cognitive flexibility.

These differences point to a larger message: humans seem to have developed an additional attention control network over evolutionary time. Contrasting both brains as they perform the same tasks is a good way of reconstructing the evolutionary forces that lead to these differences.

Humans are much more complex in the way they interact socially, so they need a better ability to single out those subtle cues and use that information to guide their future decisions than a macaque would. It's therefore possible that this additional network is used to detect behavioural information that macaques don't need. The study didn't look at social behaviours, however.

The most exciting finding is the fact that there is a clear sign that the human brain has some unique properties that separate it from other primates.

Yet, some scientists claim that the findings can't really discredit the use of the macaque brain model. They believe that here is a wealth of evidence that the macaque is an excellent model for attention research in general. Others point out that the data isn't very detailed.

For the researchers the study shows that there are some aspects of human cognition that we'll just have to study in humans, instead of monkeys. They hope that this work will push scientists to try to learn more about the macaque brain. Focusing on that could reveal much about what the human brain has done to adapt to its own environment during the past 25 million years.

According to the author, macaques did NOT develop an additional attention system because they...

1. ...did not have behavioural information.
2. ...could not get subtle signals.
3. ...did not need behavioural information.
4. ...had no need to make decisions.