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Brain's 'cheat detector' is revealed

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Part of the human brain is dedicated to detecting cheats, say evolutionary psychologists, after a study with a brain-damaged man.

"We think it develops in all normal individuals, and that it develops in part because our brains were selected to develop this competence," says John Tooby at the University of California, Santa Barbara.

Tooby and his colleagues studied a man who suffered accidental damage to the limbic system, a brain region involved in processing emotional and social information. RM, as he is referred to, performed as well as other people on one set of reasoning problems, did much worse on problems specifically designed to test reasoning about social exchanges.

At its simplest, social exchange runs along the lines of "you scratch my back and I'll scratch yours". Previous work has shown that people, and some animals, are extremely good at keeping a check of who owes who within a group - and at spotting and punishing cheaters.

Researchers had proposed that general reasoning abilities could account for this. But RM's deficit suggests that detecting social cheaters depends on specialised neural circuitry, the team says.

Their conclusion is "robust," says Nigel Nicholson, an evolutionary psychologist and director of the Centre for Organisational Research the London Business School. "It's essential we have trusting relationships with people in communities where we are highly interdependent for survival and reproduction. Cheat detection is very important," he adds.

Separable component

The first problems given to RM and the 37 non-brain-damaged controls concerned so-called precaution rules. For example: "If you work with toxic chemicals, you have to wear a safety mask." The second tested social contracts, for example: "If you go canoeing on the lake, you have to have a clean bunk house."

RM recorded a score of 70 per cent on the precaution rule tests - the same as the controls. But he scored only 39 per cent on the social contract tests, compared with 70 per cent for the non-brain damaged people.

Identical tests on two other people with brain damage similar to BM's, but with a slightly different pattern of damage, showed that their social contract reasoning was unimpaired.

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"RM's differential impairment indicates that being able to detect potential cheaters may be a separable component of the human mind," the researchers conclude in the journal *Proceedings of the National Academy of Sciences*.

Utterly unfamiliar

However, if a region of the brain has evolved to specialise in cheat detection, it should be present in all people, the team reasoned. Most experiments are performed on people living in modern, western societies.

So they studied people living in traditional, non-developed communities in the Amazonian region of Ecuador. And they found that these people were equally proficient at social exchange tasks, even when the problems concerned social rules that were unfamiliar to them.

"What is quite amazing about their performance on cheater detection is that it flies in the face of all ordinary ideas about learning a higher level cognitive skill," Tooby told **New Scientist**. "People are just as good at utterly unfamiliar rules as they are with rules that are personally and culturally highly familiar."

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