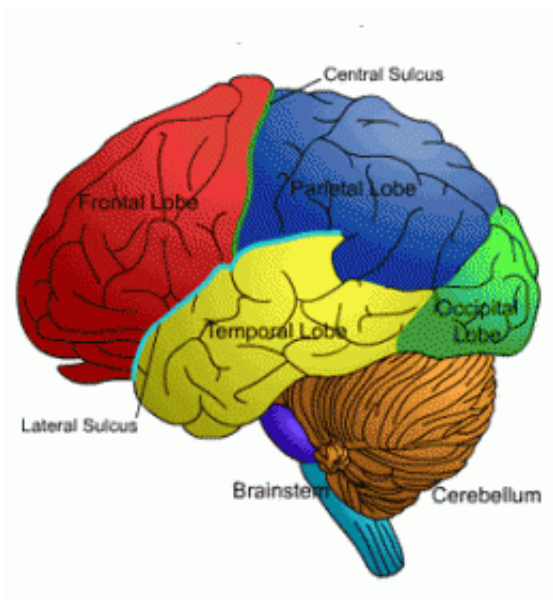


Scientists identify part of brain linked to gambling addiction

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Brain diagram. Credit: dwp.gov.uk

New research reveals that brain damage affecting the insula – an area with a key role in emotions – disrupts errors of thinking linked to gambling addiction. The research, led by Dr Luke Clark from the University of Cambridge, was published today, 07 April, in the journal *PNAS*.

During [gambling](#) games, people often misperceive their chances of winning due to a number of errors of thinking called cognitive

distortions. For example, 'near-misses' seem to encourage further play, even though they are no different from any other loss. In a random sequence like tossing a coin, a run of one event (heads) makes people think the other outcome (tails) is due next; this is known as the 'gambler's fallacy'.

There is increasing evidence that problem gamblers are particularly prone to these erroneous beliefs. In this study, the researchers examined the neurological basis of these beliefs in patients with injuries to different [parts of the brain](#).

"While neuroimaging studies can tell us a great deal about the brain's response to complex events, it's only by studying patients with [brain injury](#) that we can see if a brain region is actually needed to perform a given task," said Dr Clark.

For the study, the researchers gave patients with injuries to specific parts of the brain (the [ventromedial prefrontal cortex](#), the amygdala, or the insula) two different gambling tasks: a slot machine game that delivered wins and 'near-misses' (like a cherry one position from the jackpot line), and a roulette game involving red or black predictions, to elicit the gambler's fallacy. For the control groups, they also had patients with injuries to other parts of the [brain](#) as well as healthy participants undergo the gambling tasks.

All of the groups with the exception of the patients with insula damage reported a heightened motivation to play following near-misses in the slot machine game, and also fell prey to the gambler's fallacy in the roulette game.

Clark added: "Based on these results, we believe that the insula could be hyperactive in [problem gamblers](#), making them more susceptible to these errors of thinking. Future treatments for [gambling addiction](#) could seek

to reduce this hyperactivity, either by drugs or by psychological techniques like mindfulness therapies."

Gambling is a widespread activity: 73% of people in the UK report some gambling involvement in the past year* and around 50% play games other than the National Lottery. For a small proportion of players (around 1-5%), their gambling becomes excessive, resulting in features seen in addiction. Problem gambling is associated with both debt and family difficulties as well as other mental health problems like depression.

More information: Damage to insula abolishes cognitive distortions during simulated gambling, *PNAS*,
www.pnas.org/cgi/doi/10.1073/pnas.1322295111

Provided by University of Cambridge

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