

# Why we learn from our mistakes

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Psychologists from the University of Exeter have identified an 'early warning signal' in the brain that helps us avoid repeating previous mistakes. Published in the *Journal of Cognitive Neuroscience*, their research identifies, for the first time, a mechanism in the brain that reacts in just 0.1 seconds to things that have resulted in us making errors in the past.

Previous research has shown that we learn more about things for which we initially make incorrect predictions than for things for which our initial predictions are correct. The element of surprise in discovering we are wrong is conducive to learning, but this research is the first to show how amazingly rapid our brain's response can be. This discovery was made possible through the use of electrophysiological recordings, which allow researchers to detect processes in the brain at the instant they occur.

'It's a bit of a cliché to say that we learn more from our mistakes than our successes,' said psychologist Professor Andy Wills of the University of Exeter, 'but for the first time we've established just how quickly the brain works to help us avoid repeating errors. By monitoring activity in the brain as it occurs, we were able to identify the moment at which this mechanism kicks in.'

For this study, a group of volunteers took part in a computerised task, which involved them making predictions based on information they were given. New information was then introduced, which made many of their predictions incorrect, so they needed to learn from this in order to avoid

repeating the error. While they did this, their brain activity was recorded via 58 electrodes placed on their scalp. The researchers identified activity in the lower temporal region of the brain, the area closest to the temples. This occurred almost immediately after the person was presented with the visual object that had previously made them make an error, and before there was time for conscious consideration.

Most previous research in this field has focused on the frontal lobes of the brain, which are the areas associated with sophisticated human thought processes such as planning, analysis and conscious decision-making. The lower temporal region of the brain, which was the focus for this activity, is responsible for the recognition of visual objects.

'This brain signal could help us in many different kinds of situations,' said Professor Wills. 'For example, when driving abroad the rules of the road sometimes differ. We may make a mistake the first time we misinterpret a situation, for example not realising that in the States cars can turn right on a red light. The next time we're driving out there and see a red light, this early warning signal will immediately alert us to our previous mistake to prevent us from repeating it.'

Source: University of Exeter

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