

People with autism make more rational decisions, study shows

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People with autism-related disorders are less likely to make irrational decisions, and are less influenced by gut instincts, according to research funded by the Wellcome Trust. The study adds to the growing body of research implicating altered emotional processing in autism.

Decision-making is a complex process, involving both intuition and analysis: analysis involves computation and more "rational" thought, but is slower; intuition, by contrast, is much faster, but less accurate, relying on heuristics, or "gut instincts".

Previous studies have shown that our response to a problem depends on how the problem is posed – the so called "framing effect". A surgeon who tells a patient that there is an 80% chance of surviving an operation is more likely to gain consent than one who tells the patient there is a 20% chance of dying, even though statistically these mean the same thing.

Now, in a study published today in the *Journal of Neuroscience*, researchers in Professor Ray Dolan's group at the Wellcome Trust Centre for Neuroimaging at UCL (University College London) have used the framing effect to study decision-making in people with autism spectrum disorders (ASD).

According to the National Autistic Society, these disorders affect up to one in a hundred people in the UK. They range from mild conditions, such as Asperger syndrome, through to highly disabling conditions, such

as Rett syndrome. Symptoms – which vary widely in severity – include language problems, poor social interaction and rigid patterns of behaviour and thinking.

Participants in the study performed a task involving deciding whether or not to gamble with a sum of money. For example, they would be given £50 and be presented with two options: option A was to keep £20; option B was to gamble, with a 40% chance of keeping the full £50 and a 60% chance of losing everything. This version was known as the "gain frame".

At other times, the participants would be presented with the "loss frame", the only difference being that option A was phrased in terms of losing money. In other words, when given £50, option A was to lose £30 of their initial amount; option B was the same as above.

Despite option A being essentially the same in both gain and loss frames, the researchers found that the "control" participants – those without ASD – were more likely to gamble if the first option was to "lose" rather than "keep" money. For participants with ASD, this effect was much smaller, suggesting that this latter group was less susceptible to the framing effect – in other words, they were less likely to be guided by their emotions into making inconsistent or irrational choices.

"People with autism tended to be more consistent in their pattern of choices, their greater attention to detail perhaps helping them avoid being swayed by their emotions," says Dr Neil Harrison.

Although this attention to detail and a reduced influence of emotion during decision-making is beneficial in some situations, it may be a handicap in daily life, explains Dr Benedetto De Martino.

"During social interactions a lot of information must be processed

simultaneously, making this a very complicated computational task for the brain," he says. "To solve these complex problems we rely on simplifying heuristics – gut instincts – rather than extensive logical reasoning. However, the price that we seem to pay for this ability is that sometimes irrelevant contextual information leads us to make inconsistent or illogical choices.

"Less reliance on gut instincts by people with autism may underlie their difficulties in social situations, but also enable them to avoid potentially irrelevant emotional information and make more consistent choices."

The study reinforces previous research suggesting that the key difference in how people with ASD make decisions may lie in the amygdala, an area of the brain critically involved in processing emotions. In a 2006 study published in the journal *Science*, Dr De Martino and colleagues showed that decision-making involves activity in the amygdala. In people with ASD, the amygdala has been shown to differ from that in the majority of people – not in size, but in the density of nerve cells.

Dr Harrison believes their research may play an important role in highlighting the strengths of people with ASD, rather than focusing on negative aspects of the disorder.

"Our research shows a positive strength in people with autism, more research focussing on abilities as well as disabilities of people with autism will enable us to gain a clearer understanding of this condition while simultaneously assisting people with autism in living rich and full lives."

Source: Wellcome Trust

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