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Your gut microbiota could influence your decision-making

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WHAT if some of your decisions or behaviour were the result, not of voluntary mechanisms, but of the composition of your gut microbiota?

This thought-provoking prospect is suggested by the findings of a study by researchers at the Paris Brain Institute and Germany's University of Bonn. In particular, changes in intestinal flora could play a role in our interactions with others.

According to France's Fondation pour la Recherche Medicale (FRM), the gut microbiota is made up of "thousands of billions of microorganisms living mainly in the intestines, in symbiosis with the body, i.e. in beneficial association with each other. There are as many (of them) as there are cells in our body! They are mainly bacteria, but also yeasts and viruses".

While we already know that this flora, as it's also known, has an impact on digestive function, it could also influence our behaviour, certain emotions and even decision-making, according to the findings of scientists at the Paris Brain Institute in France and the University of Bonn in Germany.

This is not the first study to explore this association, but most of the research carried out previously has only involved animals.

"The available data suggests that the intestinal ecosystem communicates with the central nervous system via various pathways, including the vagus nerve.

"It might also use biochemical signals that trigger the release of neurotransmitters, such as dopamine and serotonin, which are essential for proper brain function," says Hilke Plassmann, head of the Control-Interoception-Attention Team at the Paris Brain Institute and professor at Institut Europeen d'Administration des Affaires (Insead), quoted in a news release.

With this in mind, the researchers decided to subject 101 men aged between 20 and 60 to behavioural tests, including the "ultimatum game", which evaluates an individual's decisionmaking and sensitivity to fairness or unfairness.

The rules of the game are simple: one participant is given a sum of money and asked to share it — fairly or unfairly — with a second participant. The latter can accept or decline the offer,

depending on whether it seems fair or unfair. In the latter case, neither player receives the reward.

The most important detail is that 51 participants took probiotics and prebiotics, used to rebalance intestinal flora, for a period of seven weeks, while 50 received a placebo.

All participants took part in the game during two sessions, at the beginning and at the end of the supplementation period.

GREATER 'SENSITIVITY TO FAIRNESS'

Published in the journal 'PNAS Nexus', the results suggest that the composition of gut microbiota may influence not only decision-making, but also "sensitivity to fairness".

In detail, the researchers explain that participants who had taken probiotics and prebiotics were more likely to refuse offers considered unequal, after the seven weeks of supplementation.

This change in decision-making and sensitivity to fairness - or unfairness - was not observed in the placebo group.

Participants who took supplements also experienced the greatest changes in the composition of their intestinal microbiota.

Moreover, "the researchers also observed a sharp drop in (the supplemented group's) levels of tyrosine, a dopamine precursor, after the seven-week intervention".

"For the first time, a causal mechanism is emerging: the composition of the gut microbiota could influence social behaviour through the precursors of dopamine, a neurotransmitter involved in brain reward mechanisms," according to the study news release.

This finding is likely to give rise to further, more targeted research.

"It's too early to say that gut bacteria can make us less rational and more receptive to social considerations.

"However, these new results clarify which biological pathways we must look at. The prospect of modulating the gut microbiota through diet to positively influence decision-making is fascinating. We need to explore this avenue very carefully," says study coauthor, Hilke Plassmann.