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## People with Metabolic Syndrome Disorders Give Lower Offers in Ultimatum Game

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### ABSTRACT

Background: The origins of the metabolic syndrome disorders are being increasingly recognized as neuro-behavioural rather than dietary or metabolic. The neuro-behavioural origins hypothesis implies that there should be detectable behavioural differences between people with and without metabolic syndrome disorders. We test here whether the economic behaviour of individuals with any of the metabolic syndrome disorders differs from that of healthy age matched controls using the ultimatum bargaining game. Methods: The ultimatum game was played by 59 persons with at least one of four metabolic syndrome disorders namely type 2 diabetes (T2D), hypertension, hypercholesterolemia and cardiovascular disease (MS group) and the results were compared to a healthy age matched control consisting of 71 persons. Results: The MS group gave significantly lower ultimatum game offers than the control group. Testing for individual disorders, type 2 diabetics gave significantly lower offers than the non-diabetic group. In binary logistic regression, ultimatum game offer was a better predictor of MS and T2D than Body Mass Index (BMI). Conclusions: There are detectable behavioural differences between individuals with metabolic syndrome disorders as compared to age matched healthy controls. The results are compatible with the neurobehavioral origins hypothesis and demonstrate further the association between metabolic states and social and economic behaviour.

### KEYWORDS

Economic Behaviour, Fairness, Metabolic Syndrome, Serotonin, Testosterone, Ultimatum Game

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