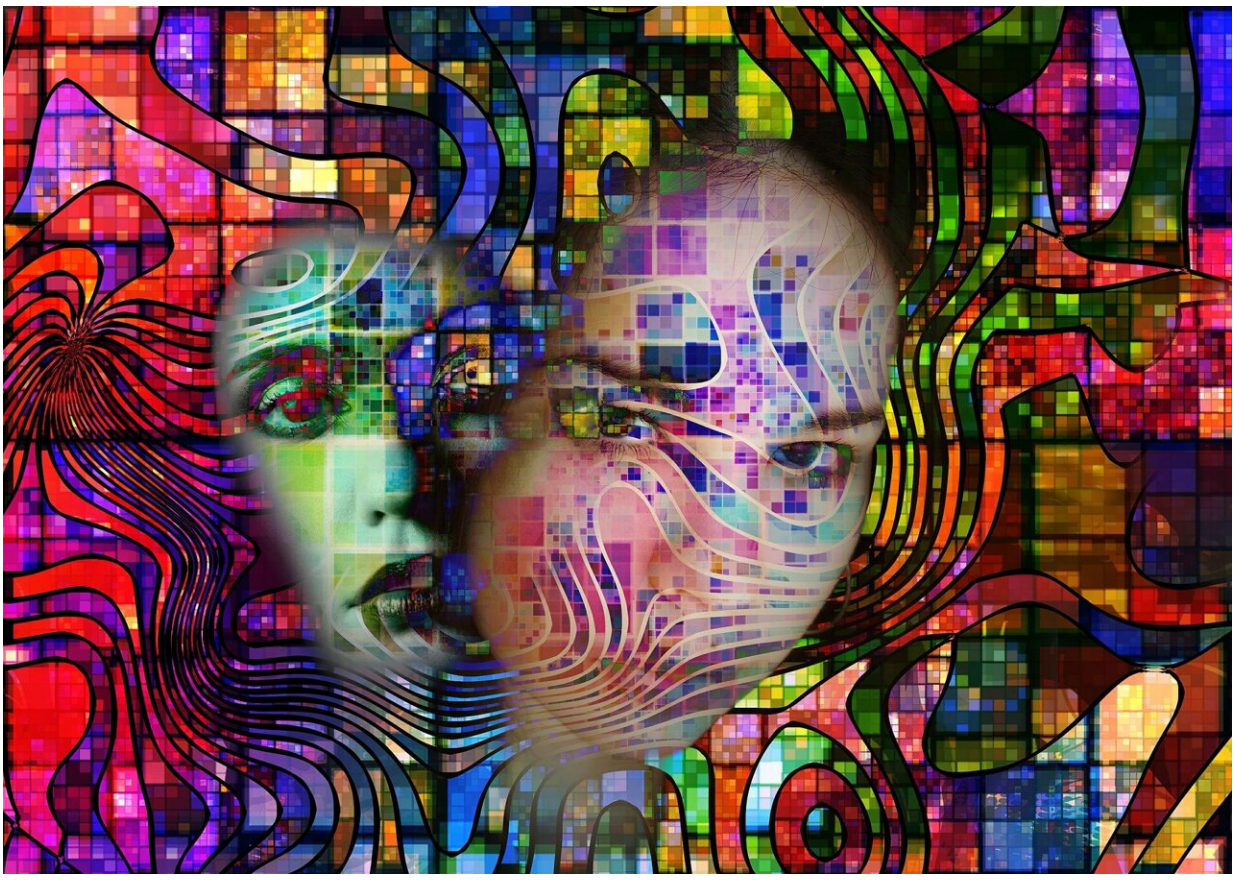
MedicalXpress

# Patients with schizophrenia at different stages show varied deficits in discriminating rewarding values

August 26 2021, by Zhang Nannan



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Anhedonia and amotivation are key features of negative symptoms

observed in patients with schizophrenia. In particular, amotivation refers to the diminished volition to initiate or maintain goal-directed behavior that may be underpinned by different impairments of reward valuation.

Range adaptive valuation or coding is considered as one of the factors contributing to amotivation in patients with schizophrenia. It is defined as the ability to discriminate reward values refers to range adaptive valuation. However, it is still not fully known whether range adaptive valuation has been altered or impaired at different stages of schizophrenia.

In order to address such an issue, Dr. Raymond Chan's team from the Institute of Psychology of the Chinese Academy of Sciences (CAS) has conducted a study to examine valuation of rewards and range adaptive coding in individuals along the continuum of schizophrenia.

They recruited 30 pairs of patient with chronic schizophrenia and their controls, 30 pairs of patients with first-episode schizophrenia and their controls, and 34 pairs of individuals with high and low levels of social anhedonia to complete a task specifically designed to capture range adaptive coding.

The participants were required to make decision on whether to choose a high-effort or low-effort physical gripping condition based on probability and reward magnitude.

Their results showed that patients with chronic schizophrenia showed over-adaptation to the value range and their performances were positively correlated with self-reported consummatory interpersonal pleasure. On the other hand, patients with first-episode schizophrenia exhibited diminished value adaptation, which was correlated inversely with avolition severity and positively with the overall proportion of choosing to exert ore effort.

In addition, individuals with high level of social anhedonia exhibited comparable range adaptive with individuals with low level of social anhedonia. However, these high level social anhedonia individuals did show negative correlation between value adaptation performances and the proportion of choosing to exert more effort under the lowest value condition of the behavioral task.

Taken together, these findings suggest a dysfunction in range adaptation in individuals along the spectrum of schizophrenia, ranging from patients with established clinical diagnosis to individuals with subclinical features of psychopathology. Such range adaptation may index a potential underlying mechanism of amotivation in schizophrenia spectrum disorders.

Using task-based neuroimaging and magnetic resonance spectroscopy paradigms, Dr. Chan's team is now undertaking studies to investigate the underlying neural mechanism of range adaptive valuation in schizophrenia spectrum disorders and other mental disorders sharing similar clinical manifestations.

"We hope these studies will open a new window for us to understand amotivation and anhedonia in schizophrenia spectrum disorders and other mental disorders," said Dr. Chan.

The study, published online in *Schizophrenia Bulletin*, is titled "Range-adaptive value representation in different stages of schizophrenia: A proof of concept study."

**More information:** Ling-Ling Wang et al, Range-Adaptive Value Representation in Different Stages of Schizophrenia: A Proof of Concept Study, *Schizophrenia Bulletin* (2021). DOI: 10.1093/schbul/sbab099

Provided by Chinese Academy of Sciences