

Reduced loss aversion and altered functional connectivity in internet gaming disorder

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Internet Gaming Disorder (IGD), a newly recognized form of behavioral addiction characterized by excessive involvement in online gaming, is gaining global attention as a significant public health issue. Mirroring

other substance and behavioral addictions, previous studies have established that IGD patients suffer damage to delay discounting, a major aspect of value-based decision-making. However, the impact of another key aspect of value-based decision-making, loss aversion, is less understood in the context of IGD.

A research team led by Professor Zhang Xiaochu from the University of Science and Technology of China (USTC) of the Chinese Academy of Sciences (CAS) examined the changes in loss aversion, a critical aspect of value-based decision making in IGD, and its associated changes in brain networks.

Their findings could contribute to the diagnosis and classification of this disorder. The study, titled "[Reduced loss aversion in value-based decision-making](#) and edge-centric functional connectivity in patients with internet gaming disorder," was published online on May 19th on *Journal of Behavioral Addictions*.

The study utilized the Iowa Gambling Task (IGT), a well-regarded paradigm for assessing value-based decision-making. Accumulating research leverages computational models to delve into the value-based decision-making process underlying the IGT, including loss aversion. Whether it's in marijuana addicts or polysubstance addicts, significant reductions in loss aversion within value-based decision-making have been observed.

In this study, IGD participants and healthy control participants performed the IGT under [functional magnetic resonance](#) imaging (fMRI) scans. Through a [computational model](#), the team explored whether loss aversion within value-based decision-making was impaired among IGD sufferers and if there were changes in the corresponding brain functional networks.

The research findings echoed those of prior studies: individuals with IGD, like those with other substance or behavioral addictions, exhibited a notable impairment in loss aversion within value-based decision-making.

At the neural level, the changes in loss aversion did not relate to node-centric changes in functional brain networks. Instead, they were associated with the overlapping community features of edge-centric functional networks involved in reward evaluation and processing (left [inferior frontal gyrus](#), right caudate, and right hippocampus).

Machine learning-based classification analysis demonstrated that the loss aversion within value-based decision making and the related edge-functional networks could distinctly distinguish between IGD participants and healthy control participants. This study holds significant implications for a better understanding of IGD and the development of future treatments, indicating that impaired loss aversion could potentially serve as a diagnostic marker for IGD.

More information: Wei Hong et al, Reduced loss aversion in value-based decision-making and edge-centric functional connectivity in patients with internet gaming disorder, *Journal of Behavioral Addictions* (2023). [DOI: 10.1556/2006.2023.00014](https://doi.org/10.1556/2006.2023.00014)

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