

# The cognitive structure of decisions under risk and uncertainty in Parkinson's disease

<https://www.neurodegenerationresearch.eu/survey/the-cognitive-structure-of-decisions-under-risk-and-uncertainty-in-parkinsons-disease/>

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Canada

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### Research Abstract

Patients with Parkinson's disease are known to respond differently in situations that involve financial risk and reward (e.g. gambling). It is said that they tend to be risk-averse when off medication, and risk-seeking when taking certain medications, to the point where some patients become pathologic gamblers and incur devastating financial consequences for themselves and their families. Current clinical tests can tell us if someone is risk-seeking or risk-averse, but do not tell us why they make decisions in a risk-prone or risk-avoiding manner. Decisions about money and risk are complex, and involve numerous cognitive operations. For example, a subject must determine how much they value the reward at stake, estimate the probability of

obtaining that reward, determine how much to stake, and in certain situations determine how much value they are willing to sacrifice to take a chance on a choice where they have little or no information about the odds or the payoff. We have created a battery of easy clinical tests that allow us to calculate each of these factors independent of the others: probability estimation, magnitude estimation, impulsivity, and the valuation of ambiguity. Our goal is to apply these to patients with Parkinson's disease on medication and off medication, as well as Parkinson's patients with a history of a gambling disorder while on medication. By using such a comprehensive battery, we will establish which cognitive operations are anomalous in Parkinson's disease and altered by the medication, giving us insights on how dopamine alters behaviours and judgements related to reward. We will also assess whether these tests reveal any characteristics in patients off medication that determine which patients have a higher risk of developing problem gambling on medication.

**Further information available at:**

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