**Title:**

Iowa Gambling Task: Comparison of the Classical Scoring and Cognitive Modeling Approach; Its Convergent validity with other clinical tasks

**Abstract:**

The aim of this study is to compare Bayesian cognitive modeling of the response style in the Iowa gambling task (IGT), specifically PLV-Delta model, (Ahn et al., 2008), and the classical approaches to IGT scoring in a non-clinical population.

We used an exploratory design to analyze convergent validity between different types of IGT scoring and other clinical tasks in a sample aged 18–30 years. Test battery included Iowa gambling task, SST (stop signal task), go/no-go task, N-back, and DDT (delay discounting task). All these tests were computer-administered. Sample size ranged between 100 and 200 for each pair-wise comparison. The Bayesian cognitive model was estimated using Stan and R environment.

Results showed convergent validity between some of the parameters of the cognitive model and the classical IGT test scores; however, the cognitive model parameters show a better incremental validity compared to the traditional scoring techniques. We also estimated reliability of IGT using several approaches. These results are discussed bearing in mind the exploratory nature of the study.

Using point estimate of parameters from Bayesian models could limit results of this study. In addition, our reliability estimates are slightly biased due to the non-normal distribution of all parameters.

This study can provide us with a better understanding of the cognitive processes that underlie decision-making in IGT in a non-clinical population. Moreover, we revealed some advantages of the Bayesian cognitive modeling approach over the classical IGT scoring. These findings have the potential to improve applicability of the Iowa gambling task in clinical practice.