DECISION-MAKING UNDER UNCERTAINTY – ERP CORRELATES OF RISK AND AMBIGUITY PROCESSING IN AN ECONOMIC DECISION-MAKING TASK

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Background: Decision-making under uncertainty takes an inherent part of human daily life. Uncertainty refers to scenarios where the decision-maker is ill-informed about relevant information regarding the outcomes of alternative options, and it comprises two distinct concepts – risk (defined as an explicit variability of the likelihood of outcomes) and ambiguity (defined as an imperfect or limited knowledge about the likelihood of outcomes). It is still unclear whether risk and ambiguity processing rely on shared or non-shared neuronal mechanisms.

Aims: The present study aims to experimentally dissociate the neuronal correlates of risk and ambiguity processing in decision-making.

Method: Eighty community-dwelling volunteers will be recruited at the end of data collection. Participants will fill out self-report measures on attitudes towards uncertainty and risk and perform a behavioural economic decision-making task designed to dissociate risk and ambiguity. Event-Related Potentials will be recorded during the behavioural decision-making task and analyzed using a hierarchical mass univariate general linear modelling approach implemented in LIMO.

Preliminary results: (a) ambiguity variations will be positively associated with increased negativity in the 200-400 ms time window at the frontal electrodes; (b) ambiguity variations will be negatively associated with increased positivity in the 400-650 ms time window at the centroparietal electrodes, and c) risk variations will be negatively associated with increased positivity in the 400-650 ms time window at the centroparietal electrodes.

Conclusions: It is expected that results will show a clear pattern distinguishing brain mechanisms underlying risk and ambiguity processing with potential applications for the understanding of decision-making under uncertainty and its maladaptive manifestations.

Keywords: Decision-making, Uncertainty, Risk, Ambiguity, Event-related potentials, LIMO

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