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A Novel Expected Utility Model of Decision-Making Under Risk

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Theoretical models of decision-making under risk (i.e., regarding probabilistic gains and losses) typically start from the framework of utility theory, which state that decision-makers select outcomes with the highest subjective utility. In these frameworks, utility is conceived as a nonlinear decreasing function of amount (i.e., concave). However, a limitation of these models is that they cannot account for the amount effect, a phenomenon indicating that decision-makers become more risk-averse as the amount of a probabilistic gain increases. This project aims to explain the amount effect using a novel sigmoidal utility model, as well as capturing the transformation between risk-aversion and risk-seeking attitudes that is sometimes observed in individual decision-making. To establish a conceptual foundation for the sigmoidal model, a brief review of the literature on decision-making under risk is provided, covering the psychological rationale and mathematical formulations of current models of decision-making. Next, the proposed model is compared with these current models, using data from a probability discounting paradigm. The proposed model provides a potential resolution to both the theoretical and empirical limitations of existing models. Although the current work is just an initial step towards the development and validation of this new model, recommendations for future studies are provided from which to generate novel predictions that could strengthen the case for the model's utility and explanatory power.