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Assessing the Validity of Three Tasks of Risk-Taking Propensity: Behavioral Measure and Computational Modeling

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Abstract

Risk-taking propensity is a general personality disposition. Survey, behavioral, and modeling approaches have been used to study it. We compared three behavioral tasks (BART, C-ART, S-ART) and corresponding computational models to learn which aspects of risky behavior they measure by correlating task performance and parameter estimates with survey responses (impulsivity, sensation seeking, drug use). Results indicated that the BART was not correlated with any of the above domains, whereas behavioral measure from the two ART tasks correlated with impulsivity and sensation seeking. The parameter estimates from the two ART tasks, while having some validity, were weaker indices than the traditional behavioral measure of these tasks. Our findings provide insight into the use and design of these behavioral tasks and their corresponding computational models.

Keywords: decision making under uncertainty; risk-taking propensity; computational cognition; parameter estimation; BART; ART