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Variables governing emotion and decision-making: human objectivity underlying its subjective perception

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Although decision-making is a logical reasoning process, it is often influenced by the underlying emotions at the moment of decision. The ability to recognize one's emotion and assess one's judgment in order to make a prudent decision is called "emotional intelligence." Yet, the definition and role of emotion played in these cognitive processes are often controversial in the psychological field. We have derived an objective model of emotion [1,2] based on biological evolutionary principles and engineering principles that uses a computational approach to address the role of emotions played in animals. This objective approach avoids the introspection and retrospection of emotions by human, which created most of the controversies in the field. Our emotion model describes emotion as an internal measure of congruency (or discrepancy) between the internally modeled world and the external reality. Thus, emotion is essentially an error measure between the prediction of the modeled system and the real world. Yet these error measures also are tinted (biased) by the perceptual assessment of the real world model.

In order to address the objectivity and subjectivity of the perceptual biases in decision-making that is influenced by emotion, we designed an experiment using the "ultimatum game" as the experimental paradigm to delineate these variables. Ultimatum game has been used extensively to assess the irrational decision-making behavior in human both experimentally using fMRI localizing the brain regions for such decision task [3,4] and computationally in behavioral economics in the past half-century [5]. It is a simple, yet powerful paradigm, which elicits emotional response and decision-making for conflict resolution. It is essentially a split-the-money game, in which an experimenter offers the subject a sum of money to share. The subject can either accept or reject the offer. If the subject accepts the offer, both keep the money; if the subject rejects the offer, both lose the money. Most often, the subject rejects the offer when he/she sees the offer as unfair. We extend this experimental paradigm to address the objectivity of the task compared with the subjective of the decision-making in relation to the emotional assessment in human subjects. The results showed that human subjects are cognitive of their objectivity and consciously report their objectivity even though their decision is based on subjective assessment of the offer, which results in the emotional response. The interactions of the underlying variables in which such decisions were made under the influence of emotions were revealed in these experiments.

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