

ABSTRACT

Human beings are complex in nature. They live in an equally complex world around them. Their survival requires a constant interaction with both humans and the environment. Such interactions involve decisions that are made with certain or uncertain probabilities of consequences. Among the various factors that affect human decision making, emotions holds a major place. Previous research suggest that the emotions have an impact in the decision making process by influencing risk perception and consequence predictions. This effect of emotion on decisions can be down regulated by using specified behavioral responses that regulate the emotion effects. Besides the extrinsic emotion regulation strategies, sleep naturally lower the tone of emotions through the process of cathartic releases. Thus, sleep acts as a natural emotion regulating mechanism.

The present thesis is an attempt to study how behavioral modification of responses after emotions (regulation strategies) influence decision-making ability under risk and with known probabilities of consequences. Further, the study also evaluates the role of sleep on affect-regulated decision making under risk. The present thesis uses both behavioral and electrophysiological data to arrive at its conclusions. Experiment 1 tested the effectiveness of emotion regulation strategies across varied emotion induction methods and valence on decision making under risk. Distraction and cognitive reappraisal strategies significantly downregulated the emotion effect and led to less risk aversive behavior, particularly in negative pictorial stimuli. Other emotion regulation strategies no longer affected risk taking, suggesting these strategies are best suited to minimize carry over effect of emotion on risky decision-making. Experiment 2 and 3 investigated the effect of sleep over deprivation on negative effect regulated risky decision-making, using

the reappraisal and distraction strategies. Electrophysiological data during the decision making task was collected in addition to behavioral data to supplement the overall effect. Sleep as compared to deprivation provides a better opportunity for downregulation of negative effect. Further, only reappraisal strategy successfully downregulated emotion effect and led to optimal decision making with maximum gains or minimum losses. The behavioral results were supported by the presence of error related negative and P300 waveforms over the front-central sites. The presence of FRN and P300 signal that subjects were sensitive to losses and were able to effectively evaluate the outcomes of the decision task on reappraisal trails across sleep nights. This leads to optimal decisions with calculated risks and beneficial outcomes for the decision maker. The present thesis reports that, reappraisal behavioral response (regulation strategy) is the most effective in downregulating emotion effects on risky decision-making and lead to maximally beneficial outcomes. This effect is further enhanced by sleep nights as sleep due to its inherent property of catharsis provided an optimal medium for effective downregulation of incidental emotion effects. Overall, the potential significance of these studies lies in understanding that how individual can employ regulation strategies to their benefit by altering their subjective experiences of emotion to maximize beneficial outcomes under risky situations.

Keywords: Emotion regulation, Distraction, Cognitive reappraisal, Risk, Decision-Making, EEG, FRN, P300.