All animals acquired the Risky Decision-Making Task (RDT) by the last day of training. As shock probability increased, risk preference decreased. Risk preferences did not significantly differ between AIC and OFC groups, however a Risk-Preferring (n = 12) and Risk-Aversive (n = 12) group was identified. The number of omissions per shock block increased as shock probability increased, but group, laser inhibition, or Preferring/Aversive subgroups could not account for this difference.

Animals expressing virus unilaterally (N = 9) showed the strongest behavioral effects when receiving inhibition Pre-choice (Deliberation). At the 25% shock probability, AIC inhibition decreases risk preference, while OFC increases it. These findings support the opposing roles of these structures in decision making. If the AIC activity is related to reward magnitude, inhibition might decrease the rat's attraction to the large risky reward. In contrast, the roles of the OFC in reward-related learning and cost-benefit decision-making might suggest inhibition would increase risky behavior.

Estrous and Risk Preference analysis in all animals (n = 24) suggests that risky behavior is modulated by an animal's current estrous stage and its individual attraction to risk (i.e., Risk-Preferring vs. Risk-Averse). High hormonal states correlated with decreases in risk preference in Risk-Preferring animals only. Rats were also more likely to omit choices during their proestrus and estrous phases, compared to their low hormone phases. The increased estrogen levels during proestrus and estrus might facilitate an animal's memory of punishment and potentiate its stress response, resulting in decreased risky behavior.

Trial-by-Trial analysis also showed that the influence of past experience on subsequent choice is partially dependent on estrous phase. Rats during high hormonal stages were less likely to stay on the Risky lever despite unpunished outcomes and more likely to persist with Safe choices. While risk of punishment is not directly translatable to anxiety, this unnecessary Safe-preferring behavior appears to contradict the suppposed anxiolytic effect of elevated estrogen levels in proestrus and estrus.